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Article 1.

The Total Extirpation of the Uterus through the Vagina.[1]

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This important operation is one of the latest conquests of modern, that is to say, antiseptic surgery, and, for the right to carry out this operation into practical life, we are indebted to Czerny, Schröder, Billroth, and Mikulicz. This is another illustration of the old saying that "there is nothing new under the sun," as total extirpation of the uterus was not only thought of, but performed, as far back as 100 A. D., by Soranos, and in the course of the following centuries, was occasionally performed in cases where a prolapse of the organ made the extirpation both imperatively indicated and reasonably practicable in conformity with the status of surgery at that time.[2]

[1] Read before the Chicago Medical Society, November 7, 1881.

[2] The first extirpation in this century of the prolapsed uterus was made by K. M. Langenbeck, for cancer, in 1813. The patient recovered, and the case was for many years the occasion of unjust doubt and criticism in the literature, until finally, thirty years after, the autopsy showed that the operation had been complete. It was Langenbeck's description of his operation that led Czerny to extirpate a non-prolapsed uterus through the vagina. It is needless to state that the extirpation of a prolapsed uterus is much easier and in reality an entirely different operation from that which we are now considering, because not only the fundus uteri but also the broad ligaments and ovaries are usually outside of the vulva and within easy reach of the operator. Consequently, there is no great technical difficulty in the operation.

A recent case of the extirpation of a prolapsed uterus was reported in 1880 by Dr. John C. Blake (*Boston Medical and Surgical Journal*, April 14, 1881) in which no cancer was demonstrated. His method of operation is rather difficult to comprehend, and his ligature *en masse* of the whole amount of tissue above what he calls the "fundus," but which probably was the cervix, is so primitive a procedure that I should deem it hardly permissible at the present time. The patient died twelve hours after the operation. The cause of death was unknown, as no autopsy was made.

But it was not until the commencement of the present century, with its numerous and fruitful impulses in the direction of methodical and scientific progress in our science, that any serious attention was directed to this subject. Mikulicz, in his interesting monograph on this subject,[1] states that a prize was offered by the Josef's Academie of Vienna, for the best essay on this subject, and the prize was awarded in 1814 to Gutberlet, who proposed a method of extirpation by abdominal section, which resembled in its main features Freund's method, and was performed sporadically several times in later years, and then fell into disuse, until Freund, half a decade ago, by the aid of the antiseptic method, again brought it systematically before the profession.

The prognosis of this abdominal operation in the course of a few years was shown to be so unfavourable that Ahlfeld's statistics, founded on not less than 66 cases, showed a mortality of 49, that is, 74 per cent., caused by the operation itself; 4 operations had to be abandoned, and only 13 patients, or about 20 per cent., recovered. It was natural that an operation so dangerous in itself, if not entirely abandoned, would at least lead the profession to consider very seriously the question of the attainment of the same end by a safer method of operation.

The total extirpation of the uterus through the vagina had previously been performed in isolated cases. In all probability the first operation of this kind was performed by Sauter in 1822, from which the patient recovered, notwithstanding the opening of the bladder. Récamier operated in 1829 in one case with good results, and, after him, several others, but usually with fatal results. The operation was consequently abandoned until Czerny reintroduced it with one successful case in 1879.[2] The first successful case was speedily followed up by Billroth and Mikulicz in Vienna and Schröder in Berlin. To the latter we are indebted for our knowledge of the comparative safety of the operation, as in 1881 he issued a most brilliant statistical report[3] of eight operations with seven recoveries and only one death, which was not caused by peritonitis or septicæmia, but from a probably unavoidable internal hemorrhage from a ruptured vessel in one of the broad ligaments.

The operations reported in the literature accessible to me up to the time of my operation were the following:—

[1] Wiener Medizinische Wochenschrift, 1880, No. 47 *et seq.*
[2] Ibid., No. 45, 1879, p. 1172; Ueber die Ausrottung des Gebärmutterkrebses.
[3] Zeitschrift für Geburtshülfe und Gynäkologie, Band vi. Heft 7, 1881, page 226.

Operator.	Cases.	Recoveries.	Deaths.	Unfinished operations.
Czerny	2	2	0	0
Billroth	7	4	3	0
Schröder	8	7	1	0
Merike[1]	1	1	0	0
Tarsini[2]	1	1	0	0
Martin[3]	12	6	3	3
Ohlshauser[4]	6	6	0	0
Bauer	4	2	2	0
Lane	1	1	0	0
Kaltenbach	1	1	0	0
Bompiani	1	0	1	0
Bardenheuer	1	0	1	0
Totals	45	31	11	3

As it will be seen from the above tabular statement, 69 per cent. of those operated upon recovered, 24 per cent. died, and in 7 per cent. of the cases the operation was unfinished. Taking into consideration that the statistics, although from a relatively small number of operations, still showed such unexpectedly favourable results from a new and almost untried method, I did not hesitate, after careful investigations upon the cadaver, to resort to the operation in the following case :—

CASE. *Mixed Cylindrical and Multiform Celled Carcinoma of the Cervix and lower half of the Fundus of the Uterus, of over Eight Months' Standing.—Enlargement of the fundus—No tangible infiltration of the broad ligaments, bladder, rectum, or vagina—Total extirpation through the vagina—Opening of the bladder—Permanent irrigation—Slight transient cystitis—Slight rise in temperature for two weeks—Temporary vesico-vaginal fistula, which closed spontaneously after four weeks—Complete recovery from the operation.*—Mrs. H., forty years of age, parents still living and healthy. No consumption or cancer in the family. She has always been spare, but otherwise healthy. Menstruation commenced at fifteen, and has always been regular. She was married at eighteen, and has had nine children. Delivery was always easily accomplished, without the aid of forceps. Of the nine children, the first two died when eighteen months old, and the fifth when two years old, from diphtheria.

Eighteen months previous to the operation she became pregnant, until which time her menses were regular. Towards the end of pregnancy, however, she felt more tired and weak than had been usual when in this condition, and, when standing, she would have a feeling of bearing down or pressure in the lower part of the pelvis, which was of a more distressing character than that experienced during any of her former pregnancies. There was never any hemorrhage, but often considerable pain, irradiating from the pelvis down the left leg.

In due time, nine months previous to the operation, she was delivered, and, during the act of delivery, noticed a peculiar cutting character of

[1] Zeitschrift für Geburtshülfe und Gynäkologie, B. 6, H. 2, 1881, p. 415; Bericht über die Verhandlungen der Gesellschaft für Geburtshülfe und Gynäkologie, zu Berlin.

[2] Gazetta Medica Italiana Lombardia, No. 15, 1881.

[3] Centralblatt für Gynäkologie, No. 8, 1881, p. 189.

[4] Berliner Klinische Wochenschrift, No. 35, 1881. Ueber, Total extirpation des uterus nach 10 eigenen fallen.

the pains, which she had not experienced in former confinements, and the after-pains, during childbed, which lasted for nine days, were, she noticed, of a similar character. There was less hemorrhage than usual during this time. When she got up she experienced a sensation as if something heavy had been left in the pelvis, and, a few weeks later, when she had recovered her usual strength, she felt pulsation, dull pain, and bearing down, giving her the idea that something was not as it should be. The midwife who attended her told the relatives that while exploring during the delivery, she had felt something unusual, like a hard lump.

Nine weeks later, a slight hemorrhage set in, which continued more or less up to the time of operation, and which occurred in the following way: Every two or three days she would have bearing-down pains, and a sensation as if something turned around, and then suddenly a quantity of blood would be discharged at once, after which there would be no hemorrhage for a couple of days, when the same series of symptoms would recur. The quantity of blood discharged increased slowly but gradually from month to month, until in July, 1881, the hemorrhages became so severe and the intervals so short that she was obliged to remain in bed for three weeks. During this time she made use of some medicine internally, and the hemorrhage ceased, but returned when she got out of bed. In the latter part of August and September the hemorrhages were less severe, but would still recur every two or three days, accompanied by the usual symptoms.

During the whole summer of 1881 she lost strength, her appetite became poor, and her condition more and more anæmic. August 14, I was called to see her, in consultation with Dr. Mead. The examination showed the following condition. The patient was pale, thin, of medium height, weight about one hundred and thirty pounds; lips and conjunctiva pale; lungs and heart normal; the abdominal walls somewhat flabby, but palpation and percussion normal. Vaginal examination revealed considerable enlargement of the vaginal portion of the uterus; the external os was sufficiently large to admit the end of the finger, and hard, irregular, and nodulated to the touch. In the anterior and posterior lacunæ no isolated tumours could be felt. Combined external and internal examination showed the uterus to be movable and the fundus somewhat enlarged, but not particularly tender. There was no enlargement of the ovaries, and no hardness or thickening or nodulated condition of either of the broad ligaments, but palpation of the broad ligament on the right side, with deep pressure, caused her some pain. Combined vaginal and rectal examination revealed no thickening of the recto-vaginal tissues anywhere, and palpation of the bladder through the anterior lacuna did not reveal any hardened tissue outside of the thickened vaginal portion. After the introduction of Sims's speculum, the vagina was found to be filled with blood, after the removal of which, the vaginal portion of the uterus was seen to be enlarged to a large tumour of about one and one half inches in diameter. The external os formed a funnel-shaped cavity one centimetre deep and one and one-half centimetres in diameter, presenting an excavated, irregular, cancerous ulcer, partly covered with discoloured grayish-white, necrotic tissue, partly with grayish-red tissue, from which a considerable hemorrhage was steadily going on. The remainder of the vaginal portion had a whitish, somewhat nodular appearance, but was covered all over with healthy mucous membrane; in the posterior and anterior lacunæ as well as in the rest of the vagina, the mucous membrane

was normal, and no isolated cancerous tumours were to be seen anywhere. The uterine probe showed the uterine canal somewhat enlarged and about four inches in length. A piece of the vaginal portion was removed from the border of the ulcer, for microscopical examination. The urine was dark coloured, clear, acid, and contained neither albumen, sugar, nor blood, and no cellular elements of any kind.

Microscopical examination of the hardened piece of excised tissue showed epithelial carcinoma, with large irregularly shaped alveoli, wholly or partly clad with a single or double layer of cylindrical epithelial cells, and filled and partly clad with large multiform epithelial cells with large oval nuclei.

Diagnosis.—Epithelial carcinoma with preponderating cylindrical epithelial cells, originating in the mucous membrane of the cervix uteri, involving the whole of the tissues of the cervix and probably extending high up in the cavity of the uterus. No extension of the carcinoma either into the rectum or bladder, or, to any palpable degree, into the broad ligaments.

The following plan for an operation was proposed and accepted. Everything was to be prepared for the total extirpation of the uterus through the vagina; the operation to be commenced with a view of making a supravaginal amputation only, if this procedure would enable me to remove the whole of the diseased tissue. But if this proved insufficient, the total extirpation of the organ should be immediately performed.

As the patient stated that at regular intervals she had sensations, though indistinct, similar to those during her menses in former times, but which still were distinct enough to enable her to differentiate between such a period of hemorrhage and the continuous hemorrhage described above, I resolved to wait for two weeks until one of these periods should be just over, before proceeding to operate, as in one of Schröder's cases, considerable pain and distress had occurred during the after-treatment of an extirpation, just at the time at which the patient expected her menses tc set in.

In the second week of September, the patient stated that the hemorrhage was accompanied by the usual sensations of the period, which terminated about the fifteenth of the month, and consequently, the nineteenth was fixed upon as the day of operation. During this interval of four days, the following preparatory treatment was enacted: The patient was kept in bed most of the time; kept on liquid diet; the bowels were moved every day, by the use of compound licorice powder at bedtime; and the vagina was washed out twice a day with three per cent. solution of carbolic acid, which sometimes caused slight burning sensations in the vulva.

Operation.—On September 19, assisted by Drs. S. D. Jacobson and E. W. Lee, of the staff of Cook County Hospital; Dr. Truman W. Miller, of the United States Marine Hospital Service; Dr. J. B. Murphy of Chicago; Dr. Bradley, House Surgeon, and Dr. Kendall, Interne of Cook County Hospital, I operated in the following manner:—

The patient was anæsthetized with ether by Dr. Kendall; placed in the lithotomy position on a table immediately opposite a window, through which the sunlight would thoroughly illuminate the field of operation. Dr. Lee, standing on the left side of the patient, made compression of the abdominal aorta. Drs. Jacobson and Miller, on the right and left side of the patient, held the femora, and each held also a Simon's speculum in the vagina. Dr. Murphy, at my right hand, had charge of the carbolized

sponges for cleansing the field of operation, and Dr. Bradley, at my left hand, had charge of the instruments.

By means of a strong vulsellum forceps, the vaginal portion of the uterus was drawn down towards the vulva, but the cancerous tissue in which it was inserted, was so friable that the forceps tore through several times, and only a moderate degree of force and traction could be employed. By means of a slightly-curved scissors, a circular incision was made through the vaginal mucous membrane, at the upper circumference of the vaginal portion, about one and one-half centimetres from the ulcerated surface of the os. The loose, submucous connective tissue was separated with blunt instruments, so as to detach the bladder and rectum from the tumefied neck of the uterus. In detaching the posterior wall of the bladder from the latter, it was found that hard cancerous tissue had infiltrated a part of the muscular coat of the bladder, and in removing this infiltrated tissue the bladder was opened, notwithstanding that its neck was held down towards the vulva by introduction through the urethra of a urethral sound having a short curve. The opening in the bladder represented a transverse slit one and one-half to two inches in length. The wall of the bladder posterior to the opening was taken hold of by a long hæmostatic forceps and held up towards the symphysis pubis. A heavy double silk ligature was passed through the upper part of the neck from the posterior to the anterior surface, the ends knotted, and the ligature used as a loop by means of which the uterus was drawn further down towards the vagina. In both lateral regions the connective tissue was too resistant to be detached from the sides of the neck by blunt instruments, and on this account I was obliged to cut it through with the curved scissors. This necessitated the ligation of several small vessels.

The whole of the neck having thus been exposed, the uterus was drawn further down, but the loop of heavy silk thread tore through the soft cancerous tissue of the neck, and I was obliged to resort again to the use of the vulsellum forceps.

With a view of limiting the operation to a supra-vaginal amputation if possible, I cut off with the curved scissors, the left half of the neck clear into the canal, and through the opening thus made introduced a finger into the uterine canal, where the exploration revealed irregularly nodulated and hard tumefied portions of the mucous membrane, reaching up towards the fundus. I consequently abandoned the idea of supra-vaginal amputation, and proceeded at once with the total extirpation of the organ. As the first step in the attainment of this end, I removed with a sharp spoon all the soft and decayed cancerous tissue of the ulcerated surface of the vaginal portion and the canal of the neck, so as to avoid septic infection from the side of the decayed tissue of the ulcerated surface when, later in the operation, it had to be inverted and turned into the peritoneal cavity. Next the anterior cul-de-sac, that is the vesico-uterine fossa, was opened by the scissors and the finger introduced into the peritoneal cavity. Using the finger as a guide, this opening was dilated outward on both sides by the scissors, keeping close to the body of the uterus until the anterior surface of the lateral ligaments was reached. The left index finger was then pushed up and around the body of the uterus, which was found to be somewhat enlarged but not adherent to any of the opposite surfaces of the peritoneum, and was therefore partly movable. The left hand was now withdrawn and the neck held up towards the symphysis pubis, by means of the vulsellum forceps, and the posterior cul-de-sac

opened in a similar manner, always keeping close to the body of the wound. The latter opening having been dilated laterally as far as the posterior surface of the lateral ligaments, the body of the uterus was anteverted by the left index finger, and the vulsellum forceps attached to the tissue of the fundus, which was so soft as to tear asunder twice before I finally succeeded in drawing it down and out through the anterior cul-de-sac, into the vulva. The left index finger was then hooked around the left lateral ligament, the fundus held over to the right by an assistant, an armed aneurism needle pushed through the right lateral ligament from the posterior to the anterior surface, and thus the ligament was ligated in two halves. A single peripheral ligature was applied around the entire lateral ligament, just exterior to the double ligature, and then the lateral ligament was cut through at a point one-half centimetre interior to the double ligature, between the latter and the uterus. The large branches of the uterine artery were not bleeding to any extent, but were, nevertheless, secured by separate silk ligatures, which were cut off short. The body of the uterus could now be draw down outside of the vulva, and no difficulty was experienced in applying similar ligatures to the left lateral ligament. Thus the entire uterus was wholly detached and taken out through the vulva. The ligatures of the lateral ligaments were left with one end long enough to extend outside of the vagina.

Through the large opening in the peritoneum, made by the removal of the uterus, projected several portions of prolapsed intestine; namely, an ansa of the sigmoid flexure, two ansæ of the small intestine, and a portion of the omentum. The wound was washed out with a two and one-half per cent. solution of carbolic acid. The hemorrhage from the bleeding surfaces was not readily checked, but was finally controlled by two silk ligatures and the use of disinfected sponges. A disinfected sponge, attached to a silk ligature, was passed into the peritoneal cavity to retain in position the prolapsed intestines, and was allowed to remain until the wound in the bladder had been closed. The prolapsed mucous membrane of the latter was dark-red in color, and presented a dotted appearance, as if numerous small ecchymoses had taken place therein. By means of sharp hooks the muscular coat of the bladder was seized, and the wound united by sutures of fine silk, which were passed through the muscular coat only, running between the latter and the mucous membrane for half a centimetre on each side. Eight of these sutures were required for the perfect closure of the wound in the bladder. All of these sutures were cut off short, with the intention of leaving them in permanently.

The next step in the operation was the closure of the wound in the peritoneum. To this end the sponge was taken out of the peritoneal cavity, and the intestines carefully cleansed from the numerous small fibrinous clots upon them. The lateral ligaments were drawn down far enough, not only to permit the palpation, but also to inspect the surface of both of the ovaries, which were found perfectly healthy, and consequently were not disturbed. An armed needle was pushed through the vaginal mucous membrane, at each lateral end of the wound in the posterior lacuna; pushed through the lateral ligament exterior to the ligatures, and then brought out through the mucous membrane of the anterior lacuna and tied, thus securing the central ends of the lateral ligaments, which were thus held down in the vagina and kept from slipping up into the peritoneal cavity. The anterior and posterior flaps of the peritoneum were seized with sharp hooks and united by fine silk sutures, of which twelve were

necessary for the perfect closure of the wound. The sutures were all cut off short and left in permanently. The slight hemorrhage caused by the stitching together of the peritoneal wound soon ceased on irrigation with two and one-half per cent. solution of carbolic acid, and the patient was put to bed on a narrow cot having a hair mattress.

Mikulicz's instrument for permanent irrigation of the vagina was introduced and fastened to a cincture around the abdomen. A lukewarm, one-tenth of one per cent. solution of thymol was used for the permanent irrigation. A flexible, soft-rubber catheter was inserted into the bladder and retained permanently. The peripheral end was held down in a vessel filled with five per cent. solution of carbolic acid.

The operation commenced at about three o'clock in the afternoon, and lasted two and one-half hours.

When the patient awoke from the narcosis, at about six P. M., she was pale and weak, but did not complain of any pain, and did not look collapsed to any considerable extent. Pulse 110; temp. 99°. 8 P. M. Pulse, 120; temp. 100°; respiration, 19. Rests quietly, and complains of no pain.

Sept. 20th. 1 A. M. Pulse, 120; temp. 100.2°. Has taken half an ounce of champagne, with bits of ice. The extremities are cold; applied hot cans to the feet. 7.30 A. M. Pulse 120; temp. 100.2°. Has rested quietly, complains of no pain, but speaks in a whisper, and appears weak. 2 P. M. Pulse 120; temp. 101.2°. Complains of pain in the abdomen, for which fifteen drops of laudanum were given, which was vomited up half an hour afterwards. She now took a tablespoonful of champagne with ice. 11 P. M. Pulse 120; temp. 102°. Complains of severe pain in the abdomen, for which fifteen drops of laudanum were given.

21st. 1 A. M. Pulse 120; temp. 101°. The patient has vomited several times, and complains of severe pain in the abdomen, for which a hypodermic injection of one-quarter of a grain of morphia was given. 8 A. M. Pulse 120; temp. 101°. Patient has rested since 1 A. M. As the pain in the abdomen had recurred, the hypodermic injection of morphia was repeated, and a pad of Lister's gauze dipped in hot carbolized water was applied over the abdomen. 4 P. M. Pulse 120; temp. 102°. She has taken small quantities of champagne and ice from time to time. The hypodermic injections of morphia quiet her for from four to five hours, but then have to be repeated as the pain recurs.

22d. 8 A. M. Pulse 120; temp. 101°. The patient passed a very restless night, but is quiet now. She sleeps for fifteen or twenty minutes only at a time. 9 A. M. Pulse 120; temp. 101.5°. She has taken half a cup of coffee, some milk, and champagne. Complains of burning sensation in the abdomen, but no pain. The urine passed through the permanent catheter contained a considerable deposit of pus, but was acid and of a normal odour. The bladder was washed out with a saturated solution of boracic acid. There is some tympanites, but no particular tenderness of the wall of the abdomen. She has passed no flatus, but says she feels that the passage of flatus would relieve the burning pain in the abdomen. A soft rubber catheter, having three additional holes cut in its walls was then inserted into the rectum and left there permanently. 10 P. M. Pulse 120; temp. 102.5°. The patient has had some pain in the abdomen during the day, which has been relieved by hypodermic injections of morphine every four to six hours. A considerable quantity of flatus has escaped through the tube in the rectum, which has eased her greatly. She

has taken from time to time small quantities of milk, coffee, and champagne. Twice she has experienced slight nausea, which was relieved by swallowing small pieces of ice. In the afternoon she became restless, uneasy, and hot, and was given a sponge-bath of tepid water and alcohol. Towards evening she became a little delirious at intervals, and complained of burning pain in the wound, and wanted the irrigating solution cold instead of warm, which request was complied with. On account of the rise in temperature, she was given four grains of quinia every four hours.

23*d*. 5 A. M. Pulse 120; temp. 101.6°. During the night the patient has slept at intervals for half an hour at a time. Complains of great pain in the abdomen; has a weary expression. Asked for beer, which was given to her in small quantities. Tympanites less than yesterday. No dull percussion anywhere along the ascending or descending colon. The vagina is very sensitive, the least movement of the irrigator causing her intense pain.

The cover of the irrigator is removed three times a day, in order to cleanse the apparatus of the débris of necrotic tissue, and fibrinous clots of exudated matter, that are too large to pass through the efferent tube of the apparatus.

The vulva and the vagina present some œdematous swelling. and the mucous membrane of the latter protrudes through the holes in the inner half of the irrigator. These protrusions resemble globular polypi, and they as well as the wound at the bottom of the apparatus are covered with a soft, yellowish mass of fibrinous exudated matter looking like croupous membrane. The wound and the internal surface of the apparatus are cleaned as far as possible by means of salicylated cotton dipped in five per cent. solution of carbolic acid; the débris brought out by the cotton has a gangrenous odour.

The solution in the vessel into which the efferent tube of the apparatus discharges has a scarcely perceptible gangrenous odour, which is overcome in great measure by the odour of the thymol solution used for irrigation.

8 P. M. Pulse 120; temp. 102°. Has had less pain in the abdomen during the day; has taken considerable milk and champagne; has slept at intervals; complains of weakness.

24*th*. 8 A. M. Pulse 120; temp. 101°; less pus in the urine than yesterday. When the bladder is washed out, after the injection of about four ounces of boracic acid solution a portion escapes through the vagina. 12 Noon. Pulse 115; temp. 100°. The patient has had half an hour of natural sleep, and is perspiring profusely. 2 P. M. Pulse 115; temp. 101.5°. Is sleeping and still perspiring freely. 4 P. M. Pulse 114; temp. 101.7°. Complains of no pain but of weakness and itching of the upper part of the back, where on examination an acute diffused eczema was found, which had been caused by the constant wetting of the sheets by the irrigating fluid, of which a part passed into the bed between the vulva and the irrigator, as the efferent tube was not sufficiently large to allow the escape of the entire amount. 6.30 P. M. Pulse 100; temp. 101.2°. 10 P. M. Pulse 112; temp. 101.2°. Has had a fit of coughing which caused some difficulty in breathing. Owing to her weakness, the exertion required to cough up the mucous matter from the throat produced a cold perspiration over the entire body, with a feeling of extreme exhaustion and almost imperceptible voice. The extremities were bathed with hot water and alcohol, and hot cans applied. Physical examination of the lungs showed normal percussion and respiration sounds, and no râles could be heard anywhere.

25th. 8 A. M. Pulse 104; temp. 101°; respiration 19. The patient rested well the remainder of the night, has no pain, partakes freely of champagne, beer, beef-tea, and coffee. She expectorates freely. The secretion from the wound is inodorous. The urine still contains pus. 10 A. M. Pulse 104; temp. 101°. 1 P. M. Pulse 104; temp. 101°. Says she feels well with the exception of pain in the sacral region from the bed-pan. 6 P. M. Pulse 104; temp. 101.2°. Is becoming restless and uneasy, but was relieved by a hypodermic injection of morphine.

26th. 8 A. M. Pulse 102; temp. 101.5°. The patient was restless until one o'clock this morning, but slept from two until four. Since that time she has been somewhat restless, principally on account of a superficial bed-sore of about the size of a dime, over the sacrum. The constant irrigating apparatus was removed with some difficulty owing to the polypus-like protrusions of the vaginal mucous membrane through the holes in the irrigator. Two of the ligatures around the broad ligaments were found to be loose and were removed. The whole of the inner surface of the vagina was superficially eroded and partially covered with yellowish adherent fibrinous matter. A double soft rubber drainage tube was now inserted, and retained in position by means of salicylated cotton covered with a layer of carbolized cosmoline. The patient was turned on the side and supported in this position by means of pillows. 12 Noon. Pulse 110; temp. 101.2°. She is resting better after a sponge-bath. 7 P. M. Pulse 100; temp. 101.2°. She has taken during the day, about eight ounces of beef-tea, with the yolk of an egg, champagne, coffee, a little chicken broth, and some Seltzer water.

27th. 8 A. M. Pulse 100; temp. 100.2°. The patient has slept several hours at a time during the night; she complains of frequent desire of micturition. The urine contains a little pus. A pill of camphor, two grains; opium, one grain, was ordered morning and night. The discharge through the drainage tubes has no offensive odour. 12 Noon. Pulse 104; temp. 100.6°. 5 P. M. Pulse 98; temp. 100.7°. The patient sleeps for half an hour at a time and complains of no pain. 12 Midnight. Pulse 100; temp. 100.6°. She feels somewhat weak, but complains only of pain in the calves of the legs, which was relieved by rubbing with alcohol.

28th. 9 A. M. Pulse 98; temp. 100.2°. The patient feels stronger and takes more food. 7.30 P. M. Pulse 100; temp. 100.4°. Has taken considerable liquid nourishment during the day; one egg, eight ounces of chicken soup, some beef-tea, besides champagne and beer.

29th. 9 A. M. Pulse 96; temp. 99.4°. She has slept considerably during the night, and her only complaint is in regard to the small bed-sore over the sacrum. 6 P. M. Pulse 96; temp. 100.8°. Has had an annoying cough during the day, which causes some pain in the left iliac region, especially when she lies on the left side. ℞. Tr. opii camphoratæ; Syrup. aurantii corticis, āā ℥j. M. Sig. every two or three hours. 12 Midnight. Pulse 96; temp. 100.2°.

30th. 9 A. M. Pulse 98; temp. 99.1°. The patient passed a somewhat restless night, but has had no pain and no cough. 1 P. M. Pulse 100; temp. 99.8°. Complains of some pain on urinating through the permanent catheter. Otherwise she feels well, and has a natural expression. She has taken to-day the first solid food since the operation; toast with her coffee in the morning, and a piece of fish and a little apple pudding at dinner. 6 P. M. Pulse 90; temp. 99.6°.

October 1st. 9 A. M. Pulse 90; temp. 98.4°. 7 P. M. Pulse 94;

temp. 100.3°. Some urine still passes through the vagina. When the bladder is washed out, about three ounces of the solution may be injected before any will pass through the vaginal drainage tube. When the urine passes through the latter, the patient complains of pain in the vulva on account of the superficial granulating erosions in the mucous membrane at this point, caused by the pressure of the irrigator during the first week after the operation. These ulcerated surfaces were covered with carbolized cosmoline applied to a tampon of salicylated cotton and placed around the ends of the drainage tube. The permanent catheter was removed.

2*d*. 10 A. M. Pulse 100; temp. 99.5°. 9 P. M. Pulse 94; temp. 100°.

3*d*. A. M. Pulse 100; temp. 99.7°. P. M. Pulse 100; temp. 100.5°.

4*th*. A. M. Pulse 100; temp. 99.7°. P. M. Pulse 96; temp. 100°.

5*th*. A. M. Pulse 96; temp. 99°. P. M. Pulse 96; temp. 100°.

6*th*. A. M. Pulse 90; temp. 99°. P. M. Pulse 96; temp. 99.7°. The patient's bowels, which had not moved since the operation, were moved to-day by an enema, and a very large quantity of feces was passed, after which she felt somewhat weak, and a little sore in the lower part of the abdomen.

7*th*. A. M. Pulse 90; temp. 99°. P. M. 90; temp. 99.5°.

8*th*. A. M. Pulse 85; temp. 99°. P. M. Pulse 90; temp. 99.2°. The patient has had a natural passage from the bowels; sleeps all night; has a fair appetite; can turn over on her side, and is feeling stronger.

11*th*. Pulse and temperature normal. The patient was taken out of bed and sat up in a reclining chair for a couple of hours. The quinine was discontinued, and two two-grain iodide of iron pills ordered three times a day.

17*th*. Pulse and temperature normal. The patient is up and around all day long, and gaining strength rapidly. When she walks, a little urine passes through the vagina, keeping her clothing wet all the time. At night there will be no passage of urine for about two hours, then the desire for micturition will set in suddenly, and before she can get the bed-pan, part of the urine will pass through the vagina. There is very little discharge through the drainage-tubes, which were removed. The nurse was instructed to wash out the vagina morning and night.

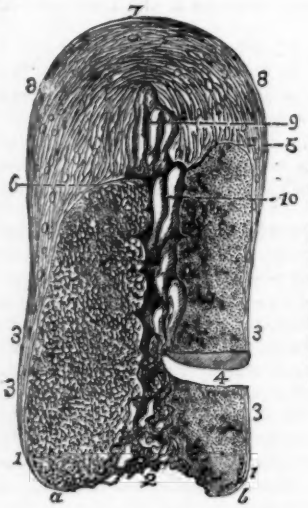
24*th*. The patient is up and around the house all day, and is feeling stronger every day. She states that she is feeling better than for the past five or six months, her anæmic condition is disappearing, and some color is returning to her cheeks. The vesico-vaginal fistula is closed, so that she has no discharge through the vagina at night. During the day she is obliged to urinate about every three hours, but all of the urine passes through the urethra. The desire to urinate still comes on suddenly, and if she does not respond quickly, some of the urine will be passed through the urethra.

On examination of the vagina with a speculum, it was seen that on the left side was a perfect linear cicatrix, but on the right side, two of the ligatures around the broad ligament were still adherent, and offered so much resistance to the forceps that they were allowed to remain *in sitû* a little longer. Lower down in the vagina were five pedunculated polypi, one centimetre long and half a centimetre in breadth, which remained as reminiscences of the irrigating apparatus as above mentioned.

Examination of the Extirpated Uterus showed the following: The whole organ was four and one-half inches long, the cavity four inches

long. The cervix was considerably enlarged, being about two inches in diameter; the thickness of the wall at this place was more than three-quarters of an inch. The external os and the whole of the cervical canal presented an irregularly ulcerated surface, and the thickened wall was seen to consist of white carcinomatus tissue. The body was enlarged, two and one-half inches broad, one inch and three-quarters in antero-posterior diameter, and six inches and three-quarters in circumference. The anterior wall was one inch thick, the posterior wall three-quarters of an inch. The whole of the lower half of the cavity of the body was filled by an irregularly nodulated cancerous mass, covered with hypertrophied mucous membrane, as shown at 10, in figure 1. The cancerous mass infiltrated the wall of the body as high up as the tumour of the cavity extended, namely, involving the entire lower half of the anterior wall, and extending higher on the posterior wall, so as to involve the lower two-thirds of the latter.

Fig. 1.



ANTERO-POSTERIOR SECTION THROUGH THE EXTIRPATED UTERUS.—1. Vaginal portion; *a*, anterior lip; *b*, posterior lip. 2. Ulcerated external os. 3. Cervix uteri. 4. Cut through the neck, through which digital exploration revealed irregular cancerous masses in the cavity of the fundus. 5. Limit of cancer in the posterior wall of the fundus. 6. Limit of cancer in the anterior wall. 7. Fundus of the uterus. 8. Healthy wall of the somewhat enlarged fundus uteri. 9. Dilated upper half of the cavity of the fundus uteri. 10. Globular cancerous vegetations in the mucous membrane of the lower half of the cavity of the fundus uteri.

Microscopical Examination of the Tumour showed the following: A section from the centre of the infiltrated wall showed a stroma of connective tissue and organic muscular fibres infiltrated with numerous young lymphoid or connective-tissue cells. The stroma inclosed very large and irregular-shaped cavities, some of which were lined with cylindrical cells, and filled with large, multiform, epithelial cells; others had no regular lining of cylindrical cells, but contained large epithelial cells, mostly irregular in shape, but some of which approached the cylindrical type, and others the pavement-cell type.

A section from the upper border of the tumour showed the large carcinomatous alveoli, defined by a rather sharp line, above which the uterine tissue showed the normal structure of organic muscular fibres, connective tissue, and vessels, not infiltrated with any proliferation of young cells.

Sections made at various points on the cut surfaces of the lateral ligaments showed neither alveoli with epithelial cells, nor infiltration with leucocytes or young connective-tissue cells.

Consequently, the character of the tumour was found to be the following: An epithelial carcinoma of mixed cylindrical-celled and pavement-celled types, leaning rather towards the character of the typical so-called epitheliomas, than to medullary carcinomas. The sharp line of definition upward pointed to a relatively local, hence relatively benignant character of the growth. The cylindrical cells in the alveoli and the extension of the carcinoma high up in the cavity of the corpus showed its origin to have taken place in the mucous membrane of the cervix uteri. The absence of carcinomatous matter in the broad ligaments gave some reason for the hope that the whole of the carcinomatous tissue had been removed, which, taken in connection with the relatively benignant character of the tumour, led to the belief and hope that the reappearance of the tumour, either here, or in the neighbouring lymph glands, might be deferred for a period corresponding to the good results obtained from the extirpation of epithelial carcinomas in other parts of the body, as, for instance, the lips and rectum.

As this operation is one of the latest of the steps forward in modern surgery, and cannot as yet be considered the common property of the profession, because it has not yet passed out of periodical literature, not even so far as into any monograph, I shall try, as far as the material at my command will permit me, to review the subject, considering, first: The indications for the operation; second, the operation itself; third, the after-treatment; fourth and finally, the results.

I. *Indications for the Operation.*

Malignant growths of the uterus have thus far been the only indications for the vaginal extirpation of that organ. Comparing the statistics of the abdominal with those of the vaginal operation, it is safe to say that whenever the total removal of the organ is indicated and this can be done through the vagina, that is, when the body of the organ is not enlarged to a very considerable extent, the latter method is preferable to the operation by abdominal section, for the following reasons:—

(a) *The shock*, which we know to be a capital danger in any protracted operation combined with laparotomy, is so much less in the vaginal extirpation that Schröder has been generally acknowledged to be correct in his statement that a woman after the total extirpation of the uterus through the vagina resembles rather a puerpera after a considerable post-partum hemorrhage, than a patient who has just experienced a very severe operation.

(b) *The ligation of the ureters*, and the accidental division of the ureters and opening of the bladder can be almost if not entirely avoided in the vaginal extirpation by sufficient skill and care in the operation; while this dangerous and often fatal complication is likely to, and in a number of cases has actually taken place during the abdominal operation, because the field of operation in this method is far from the surface; so far, indeed,

that resection of the symphysis pubis has been proposed as a facilitating measure. Besides this, the separation of the organs in question from the uterus has to be effected in the dark, while in the vaginal extirpation this part of the field of operation is much more easily accessible.

(c) *The safe removal of all the carcinomatous tissue*, which, as most uterine carcinomas, originate in or near the vaginal portion, and sometimes appear as isolated nodules involving the vaginal mucous membrane in one or both lacunæ, can be effected with almost entire certainty through the vagina only, where the whole of the field of operation is open to view; while by the abdominal operation the removal of the vaginal portion is performed entirely in the dark, guided only by the digital touch.

The character of the malignant growth, which is to be extirpated through the vagina, will, as above stated, be most frequently a carcinoma, more rarely a sarcoma, and even more rarely, as in Czerny's case, an adenoma of the mucous membrane, originating in a fibro-myxo-myoma of the wall of the organ.

When one of these malignant growths has originated in the cervix and involves part of the fundus, or has originated in the fundus and extended from there to the neck, and the fundus is not enlarged above a size that will permit of a complete version of the organ through the anterior or posterior lacuna into the vagina, the operation is indicated. A large majority of uterine carcinomas commence in the vaginal portion and will, when operated upon in time, permit a radical extirpation of all the diseased tissue by means of an operation much less dangerous, supra-vaginal amputation of the cervix uteri. Consequently, the total extirpation through the vagina will be required in cases of these carcinomas, only when they have not been operated upon in time, that is, not until the carcinoma has extended above the internal os.

A uterine carcinoma seldom originates in the mucous membrane of the cervix. According to the laws of development of such carcinomas, the tumour will generally be a cylindrical-celled carcinoma, and this form of cancer will be apt to reach far up into the cavity of the fundus at an early stage of the disease, before any considerable enlargement or ulceration of the vaginal portion has taken place. Consequently, carcinomata originating in the mucous membrane of the cervix will indicate, almost from the beginning of the disease, the total extirpation of the uterus through the vagina.

It may be difficult in a number of cases to decide, even after most minute preliminary examination, whether a uterine carcinoma involving the vaginal portion and the cervix can be removed satisfactorily by supra-vaginal amputation alone, or by total extirpation of the organ. Practically the decision is only of slight importance, if we proceed in the following manner: Prepare for the total extirpation; commence the operation as if the removal of the cervix only were to be performed; then if it is

discovered that all the diseased tissue cannot be removed by this procedure, proceed at once to the total extirpation. This plan of procedure does not involve any loss of time, either to the patient or to the operating surgeon, because supra-vaginal amputation is the first step in the total extirpation through the vagina.

The sarcomas, which originate much more frequently in the fundus than in the cervix, will undoubtedly, in most cases, before the operation can be considered, have enlarged the fundus to such an extent as to make the extirpation *per vaginam* impracticable, thus limiting their extirpation to one of the abdominal operations.

But if a sarcoma of the uterus can be diagnosed in time to permit the removal of the organ through the vagina, this operation would not only be preferable, but would also be likely to give most satisfactory results as to permanent cure, since we know that uterine sarcomas are much less liable to involve the broad ligaments than carcinomas.

In the more rare forms of malignant growths, such as adeno-fibromas or adeno-sarcomas, the total extirpation of the uterus through the vagina is to be considered in the beginning of the disease, when the hemorrhages and relapses cannot be controlled by any other operative procedure. But unfortunately most myxomas, fibro-myxomas, and fibro-myomas cause too great enlargement of the fundus before the operation can be considered, and consequently require total abdominal extirpation or abdominal amputation of the cervix. Adenomas also will generally permit of the removal of the involved tissues by scraping out with the sharp spoon, or by cauterization with the galvano-cautery. But still Czerny's case stands as an example of the possible indication of the operation in this variety of tumours.

As contra-indications to the total extirpation through the vagina, we may mention considerable involvement of the broad ligaments, bladder, or rectum by the cancer, and the palpable infiltration of the deep-seated lymph glands along the border of the pelvis minor, and finally very limited mobility of the uterus. If it is found on exploration that the uterus cannot be moved up and down almost as easily as when in its normal condition, but is attached to the walls of the pelvis minor, or to the organs situated behind it, the operation may have to be abandoned, because it is a *conditio sine qua non* for its practicability that the vaginal portion can be drawn down almost into the vulva, or very near to the end of the vagina. Too violent traction may cause rupture of adhesions or of the broad ligament, with subsequent hemorrhage from vessels situated so high up in the abdominal cavity as to be entirely inaccessible for surgical control through the vagina.

II. *The Operation.*

A few preparatory measures before the operation may be indicated. If the patient has a fetid carcinomatous ulcer of the vaginal portion, or of

the external os, we naturally desire to have the mucous membrane of the vagina disinfected as far as possible before leaving this cavity in open communication with the pelvic cellular tissue, or even the peritoneal cavity. To this end it has been advised that the entire decayed wall of the cancerous ulcer be scraped out with the sharp spoon as a preparatory procedure, five to eight days before the operation; and then that the vagina be washed out two or three times daily with a two or three per cent. solution of carbolic acid. After each injection the vagina should be filled up with salicylated absorbent cotton to take up any fetid matter which may be excreted from the tumour. During this period it is advisable to give only liquid food to the patient, and to administer mild cathartics sufficient to produce daily alvine discharges, with a view of having the bowels empty at the time of the operation, that alvine discharges may not occur during the first week or two of the after-treatment.

Six reliable assistants are required in performing the extirpation. The patient is deeply anæsthetized and placed on a table, in the lithotomy position. Good light (I should always prefer sunlight) upon the field of operation is very necessary. The vagina is first washed out with a five per cent. solution of carbolic acid; the hairs on the mons veneris and perineum carefully shaved off, and the skin around the vulva cleaned and disinfected by means of soap, nail-brush, and three to five per cent. solution of carbolic acid. The spray is not employed, as it is unnecessary and troublesome; but the field of the operation is constantly irrigated by a two to three per cent. solution of carbolic acid, either by an irrigator, or, what I consider preferable, by disinfected sponges.

An assistant on each side holds a femur of the patient, and also a Simon's speculum for dilatation of the vulva. The blade of the speculum should be a little longer than usual; that is, two and one-half to three inches instead of the ordinary length, two inches, and somewhat concave laterally, so as to fit against the pubic arch, with a view to the dilatation of the vagina to its utmost extent.

If the entrance to the vagina should be too narrow, as may be the case in nulliparæ, the perineum should be divided in the median line. This wound may, at the close of the operation, be united by a simple perineorrhaphy.

If it is discovered later in the operation that any part of the vagina is too narrow, it may be enlarged with a knife in the lateral regions, so that the bladder and rectum may not be accidentally opened.

The vagina having thus been sufficiently dilated by means of Simon's specula held against the anterior and posterior wall, the vaginal portion of the uterus is now seized by a strong vulsellum forceps, and drawn down as far as possible toward the vulva. In the majority of cases, the cancerous tissue which is seized by the forceps is so soft and friable that the forceps will tear through when the necessary traction is applied to the

organ. To obviate this difficulty Billroth has devised a strong vulsellum forceps, having four instead of two hooks at the end of each branch. The only additional change in this instrument that I suggest, is that these hooks be flattened instead of cylindrical, so that the friable tissue may be more firmly held.

The vaginal portion having thus been drawn down towards the vulva, Mikulicz advises that a heavy silk ligature be passed through each lateral portion of the fornix of the vagina, close to the cervix, and within the area of the tissue to be extirpated. From experiments on the cadaver, I was unable to see how these loops could facilitate the drawing down of the organ, as I invariably found that on exercising any traction upon them, the mucous membrane and soft tissues around the cervix would alone be drawn down, the cervix not yielding. Schröder does not make use of these loops, but handles the organ with the vulsellum forceps alone.

The next step in the operation is to make a circular incision through the mucous membrane of the fornix of the vagina around the lower end of the cervix. It is needless to state that this incision must be made about one centimetre distant from any visible carcinomatous infiltrated portion of the mucous membrane of the vaginal portion. The loose sub-mucous, cellular tissue should be separated from the infiltrated cervix by means of blunt instruments, such as the handle of the scalpel or the closed curved scissors, that is, with the instrument which has been used to make the incision. I prefer for this purpose the curved scissors, such as are generally used in plastic vaginal operations. When this dissection has been made, the uterus will yield more readily to the traction of the vulsellum forceps. It is now advisable to pass two loops of heavy silk through the middle or upper portion of the cervix, by means of which the latter may be drawn down and handled more easily.

On the lateral sides of the cervix, the connective tissue forming the lower borders of the lateral ligaments is firm and resistant, and will require the knife or scissors for its division. We must here expect to meet with bleeding vessels which will have to be ligated separately. To avoid unnecessary hemorrhage it is well to act upon Czerny's suggestion, and place an assistant on the left or right side of the patient, to make digital compression of the abdominal aorta, whenever needed during the operation.

The dissection of the cervix being finished, the uterus can be drawn further down, usually enough to allow of the palpation with the finger of the lower portion of the fundus uteri.

At this period of the operation it must be decided whether the supra-vaginal amputation or the total extirpation of the uterus shall be performed. A double heavy silk thread is passed through the lower portion of the fundus, looped, and taken to the side to be used later in handling the fundus. Mikulicz knots this loop and uses it as a hæmostatic during the amputation of the cervix. I prefer, however, not to use this ligature,

as I can then judge better of the condition of the parts after the amputation. An incision is now made through the cervix into the uterine canal, or still better, the entire cervix is removed. The uterine canal is explored by the finger, in order to ascertain if, and how far, the cancerous infiltration has involved the mucous membrane of the fundus. By means of this exploration and the examination just referred to, we will be able to decide whether supra-vaginal amputation will enable us to remove the whole amount of cancerous tissue, and if so, to complete the operation at this point in the usual manner by uniting the cut surfaces of the mucous membrane. If, however, the whole of the cancerous tissue cannot be removed by this procedure, the next step in the total extirpation of the organ must be made, namely :—

The Opening into the Peritoneal Cavity. (a) *Opening of the Anterior Cul-de-sac.*—Here we will have to use extreme care to avoid the opening of the bladder. In some cases this dissection is very easy; in others, very difficult. By the loop mentioned above, the fundus of the uterus is drawn downwards and backwards toward the anus, and the loose connective tissue between the bladder and the uterus separated by blunt instruments. If in making this separation we keep too close to the fundus, we run the risk of dissecting into the tissue of its wall, in which case all of the diseased tissue may not be removed; and, on the other hand, if we keep away from the fundus uteri and close to the bladder, we may penetrate the posterior wall of the latter, which, if its wall is not diseased, should by all means be avoided. As an aid, at this stage of the operation, Mikulicz has made a very rational proposition, namely, to introduce a catheter or urethral sound with short curve through the urethra into the bladder, to turn the point forward, so as to push the cervix of the bladder out into the vagina, thereby making the posterior wall of the bladder tense, and at the same time lifting it up and away from the anterior wall of the uterus, which has been drawn backwards and downwards.

When dissecting with the organs in this position, the accidental opening into the bladder will be avoided, and, finally, we will reach the peritoneum, through which, in the median line, a little opening is made, and through this opening a finger is introduced into the vesico-uterine fossa. Using the finger as a guide, the opening in the peritoneum is now dilated outwards on both sides, keeping close to the uterus, until the anterior surface of the broad ligaments is reached.

By holding the bladder and uterus in the positions just described, there is little or no danger of cutting into the ureters, as they will be from one to two centimetres out of the field of operation. As to the opening of the bladder, there are cases in which the cancer has extended into its muscular coat, or even through this and into the mucous membrane. As it is a law in the removal of cancerous tumours to remove all the diseased tissue, irrespective of the organs met with, except as far as actual and immedi-

ate danger to life is concerned, we may proceed (as in my case) to the opening, in some cases necessarily extensive, of the bladder. Schröder does not hesitate, when necessary, to recommend the deliberate performance of this complication to the operation, and my case shows that this can be accomplished without any danger to the patient when the vesical wound is carefully closed, and the after-treatment conducted with reference to this complication. I shall return later on to the further consideration of this point.

(b) *The Opening of the Posterior Cul-de-sac.*—When the uterus has been drawn upward toward the symphysis pubis, one or two fingers should be introduced through the anterior cul-de-sac, hooked around the fundus, and passed down into Douglas's cul-de-sac, and the opening of the latter easily effected on the point of the finger as a guide. The opening thus made is dilated outwards toward the lateral ligaments, in the same way as this was accomplished in the anterior cul-de-sac. In passing the fingers around the fundus we may sometimes meet with adhesions between the latter and the surrounding peritoneal walls. Such adhesions should be separated, if possible, by the finger nails, as close to the uterus as possible. Too firm, heavy, and extensive adhesions may necessitate the abandonment of the operation at this point (Martin), as too forcible traction would be liable to tear off large portions of the parietal peritoneum, torn vessels in which might cause hemorrhage into the peritoneal cavity at a point too high up to permit the bleeding vessels to be caught up and ligated from the vagina.

The fundus of the uterus is now adherent only by or suspended in the lateral ligaments; but before we can seize these, we will have to proceed with the next step in the operation:

The Eversion of the Fundus Uteri.—It is necessary to seize the fundus and draw it down into the vulva, before the lateral ligaments can be brought into the field of operation. The eversion may in many cases be accomplished by combined manipulation with the index finger of each hand, without any particular difficulty. But in some cases, when, for instance, the fundus is somewhat enlarged, or the lateral ligaments short and tense, it may prove a rather troublesome step in the operation. Sharp hooks or the vulsellum forceps, introduced through the vesico-uterine fossa, and seizing the fundus uteri, which has been pressed forward by the index finger of the left hand in Douglas's fossa, will usually be sufficient to bring the fundus down through the vesico-uterine fossa into the vagina. But in a number of cases the tissue of the fundus is soft, and these instruments will tear through. As the operation itself is so difficult, and the time occupied in its performance so great, any suggestions by which the duration of any of the steps of the operation may be shortened, and the operation facilitated should be accepted with gratitude.

Martin, who has several times met with difficulty in the eversion of the

uterus, has devised[1] an instrument of about the shape and size of the urethral sound, the end of which is enlarged into an oblong, oval body, or as he describes it "pear-shaped." The circumference of the end is four centimetres, and the whole instrument thirty-three centimetres long. He pushes the pear-shaped end of this instrument into the uterine canal, holding the handle and shaft up against the symphysis pubis. On bringing the shaft down towards the rectum, the fundus uteri can be pushed upward against the concave surface of a Sims' speculum, and be made to slide out, far enough along this, to be seized in the anterior lacuna. A loop of heavy silk thread is now passed through the fundus, the ends knotted, so that by it the fundus may be drawn down, or moved in any desired direction during the next step of the operation:

The Separation of the Uterus from the Lateral Ligaments.—The main point to have in view during this stage of the operation is to effect perfect security for immediate, and especially for secondary, hemorrhage from the large vessels supplying the uterus. This may be effected in two ways: (*a*) By the separate ligation of every bleeding vessel as soon as opened (Czerny, Hofmeier); or (*b*) By ligating the lateral ligaments *en masse* (Billroth, Mikulicz, Schröder). The future must decide which of these methods is preferable; each of them has its decided advantages.

(a) *The gradual division and successive ligation of all vessels* is the most rational, on general surgical principles, and possesses the two following advantages: First, It permits us to inspect the entire cut surface of the ligaments, and ascertain if any cancerous tissue has been left *in sitû*. If this has been done, it permits us by means of blunt instruments, as for instance, two dissecting forceps, to excavate and remove any spots of cancerous tissue, cancerous infiltrated lymph ducts and lymph glands, as far as the exterior wall of the pelvis minor. This may be done with the same security and in exactly the same way in which the similar operation for the removal of cancerous lymph glands in the axilla, after the removal of a cancerous mammary gland, is performed. Second, It has the advantage of not leaving any part of the lateral ligament to slough, as does the ligature *en masse*, and consequently, there is no risk of leaving decomposing tissue in or inside of the peritoneal wound.

This procedure has the following disadvantages, which of course are identical with the advantages of the other method, namely, that it takes a longer time and is less secure, as regards the stopping of hemorrhage.

(b) *Ligature en masse.*—I feel inclined, with Billroth, Mikulicz, and Schröder, to consider the ligature *en masse*, as the safest and most easily accomplished. The way to proceed therewith is as follows: Pass a heavy silk thread round the entire ligament, and ligate as far out towards the lateral wall of the pelvis as possible. Insert just at the medial side of

[1] Centralblatt für Gynäkologie, No. 5, 1881, p. 90.

this ligature through the midst of the lateral ligament, a double heavy silk thread, by means of a pointed, curved, aneurism needle, and thus ligate the ligament in two portions. Leave one of the ends of these ligatures long enough to extend outside of the vagina. As the lateral ligaments are often rather voluminous, and the slipping of the ligatures would be a very undesirable accident, Billroth's avoidance of this by the following device is noteworthy. Before applying the ligatures around the lateral ligament, he seizes the latter, through its entire thickness, with a strong forceps having two long and narrow branches, made especially for this purpose, and closing the forceps forcibly, he makes by means of its branches a depression, furrow, or sulcus in the ligament, exactly the same effect as is produced in the pedicle of ovarian tumours by means of the common, temporary clamp. In this furrow he applies the ligature *en masse*, after the removal of the forceps. A second furrow is made for the double reserve ligature, in two portions.

When thus the lateral ligament is securely ligated, the long ends of the ligatures are run downward and outward, the uterus drawn inward toward the median line, and the central portion of the lateral ligament divided at about one centimetre from the ligature. For further security against hemorrhage the larger vessels met with may be ligated separately with catgut or silk.

One of the lateral ligaments having thus been divided, it is easy to draw the fundus uteri down into the vulva, and then not only explore with the finger but even inspect with the eye, the ovaries and the whole of the lateral ligaments. If any of these parts are involved with cancer or otherwise degenerated, the question of their removal naturally presents itself. As far as I know, this has not yet been performed successfully, but in cases of need, where the diseased parts in question are sufficiently movable to permit of their being brought down into the field of operation, ligatures can be passed around their peripheral attachments, and they themselves removed (Schröder). The second lateral ligament is easily ligated, in the same manner as above described, the uterus separated entirely, and taken out through the vulva.

Treatment of the Peritoneal and Vaginal Wounds.—It is as yet an open question whether the wound in the peritoneum shall be left open or carefully united. To me it seems decidedly the most rational procedure to unite the whole of the peritoneal wound as carefully as possible (Czerny, Martin). To this end, I proceed in the following manner:—

A heavy silk ligature is pushed in through the mucous membrane of the posterior lacuna, near the lateral corner of the vaginal wound; passed through the midst of the ligatured lateral ligament, just outside of the ligature, and brought out through the mucous membrane of the anterior lacuna. When this ligature is tied it serves to draw the peripheral end of the lateral ligaments down into the vagina, or at any rate into the

vaginal wound, with a view of keeping the sloughing central portions of the lateral ligaments out of the peritoneal cavity.

After having carefully cleaned the prolapsing intestines with disinfected sponges, some of which are allowed to remain for a short time between the intestines and the upper part of Douglas's fossa, I take hold of the edges of the peritoneum with sharp hooks, draw them down and towards each other, and unite them carefully with fine sutures of disinfected silk, distant about one-half centimetre from each other, commencing in the median line so as to be hindered less by the prolapsing intestines, and continuing from this point outward on each side until the last suture is closed to or through the peritoneal surface of the lateral ligament, which had previously been drawn down.

If the bladder or rectum has been opened by accident or intention, these openings are carefully united by a sufficient number of fine silk sutures, taking care to have these passing through the muscular walls of these organs alone, and not involving the mucous membrane. All these sutures are cut off short and left in permanently.

Some operators (Billroth, Mikulicz, Schröder) do not unite the wound in the peritoneum. Schröder leaves it as it is and inserts a heavy drainage tube, terminating in a transverse portion, the ends of which rest upon the upper inner surface of the ligated lateral ligament. The vaginal portion of this tube is kept firmly in place by means of salicylated cotton wound round it.

Billroth and Mikulicz pass through the edges of both flaps of the peritoneal wound, silk threads, two or three on each side. These are knotted, and when traction is made upon them, draw the edges of the wound together so that it resembles the mouth of a tobacco pouch. The latter procedure of Billroth and Mikulicz is resorted to, not with a view of using drainage tubes, but rather with a view of employing permanent irrigation in all cases. To the external opening of their irrigator are attached the ends of all the silk threads both from the peritoneal wound and from the lateral ligaments. That this latter procedure does not present any absolute security against invasion of the peritoneal cavity by liquid or micrococci from the vagina is obvious, and in cases like my own, in which the bladder was opened, I should certainly trust nothing but a most minute closure of the peritoneal wound.

Before considering the after-treatment, I shall only say about the operation, that even under the most favourable circumstances it is a long and difficult one. The space that is left for the field of operation is small. The appliance of sutures and ligature of vessels has as a general rule to be done one or two inches internal to the vulva. The working space in the vagina may be increased somewhat by the use of a Simon's speculum, applied in each lateral wall of the cavity. No considerable hemorrhage has been reported in any of the cases on record, still the compression of the abdominal aorta may, in case of need, be of great value.

In less favourable cases, in which, on account of adhesions or for some other reason, the uterus is not very movable; the walls of the vagina more rigid; the bladder or rectum opened; the operation certainly deserves, as Martin says, "to be classed as one of the most difficult operative procedures in abdominal surgery."

Possible Mishaps during the Operation.—We have already mentioned the opening of the bladder and rectum and shown that this may be sometimes necessary, so that these should not be counted among the mishaps, strictly speaking, and the treatment of such openings by careful union has been also mentioned.

The division of one or both of the ureters might be among the possibilities, though I do not know that it has happened in any of the cases on record. The only way to obviate the ill consequences of such a division, that is, evacuation of urine from the ureter into the peritoneal cavity, would be to seize the upper end of the divided ureter, pass a loop through its wall, draw it down into the vagina, and fix it there by means of sutures. When this is carried out effectually, I do not think that the mishap would necessarily endanger the patient's life, as the wound would heal up, and only a uretero-vaginal fistula would remain.

The involving of one of the ureters in the ligature *en masse* of the lateral ligament should, of course, be studiously avoided. If, however, the operator exercise due care, there is hardly any risk of this most dangerous, not to say fatal, complication.

The accidental opening of the intestines prolapsing from or tied down into the vesico-uterine or Douglas's fossæ by old adhesions is within the more remote possibilities. Undesirable as such an accident would be, it might not be necessarily fatal if a perfect union with catgut, or better, fine aseptic silk sutures is carefully effected, according to the well-known laws for operations upon the intestines.

Hemorrhage from torn vessels situated too high up in the pelvic cavity to permit of effective ligature may, as above stated, prove fatal, but this, we are happy to say, is rarely met with.

III. *After-Treatment.*

The main and predominant question in the after-treatment is the question of drainage, combined or, we might say, identical with that form of the antiseptic method or antiseptic precautions which will prove the most effectual in keeping inflammation or infection away from the wound, and the surrounding tissues and cavities. In considering this question, we must take into account the merits and demerits of drainage tubes and the washing out of the vagina through these, on the one hand, and permanent irrigation on the other.

(a) *Drainage Tubes.*—A heavy drainage tube with a transverse T-shaped portion resting in the ununited peritoneal and vaginal wound, and

retained in position by salicylated cotton wound around it, is employed by Schröder. He makes injections of disinfectant solutions only when rise in temperature or fetid smell of the discharges calls for it. His brilliant success with this operation is a strong argument in favour of his method of treatment, in spite of any *à priori* objections that might be made about not uniting the peritoneal wound and the infrequent washing out of the drainage tube. Martin makes use of drainage tubes only for the drainage of the vaginal wound, as he recommends a careful union of the peritoneal wound.

The use of drainage-tubes has the great advantage that it incommodes the patient very little in the after-treatment as compared with the permanent irrigator. But it is still an open question whether sufficient disinfection can always be effected by them in cases where the bladder or rectum has been opened. In one of Czerny's cases, in which the bladder was opened, the peritoneal wound was united, drainage-tubes inserted, and the patient recovered. In Billroth's case, No. 4, in which the bladder was opened, and united by sutures, and the patient died from septic peritonitis thirty hours after the operation, drainage-tubes were employed in the ununited peritoneal wound according to Schröder's method.

(b) *Constant Irrigation.*—Two fatal cases of Billroth's, in which peritonitis occurred notwithstanding the use of drainage-tubes, led Mikulicz to consider permanent irrigation as a method permitting more perfect disinfection, and thereby promising the avoidance of fatal septic inflammations; namely, septic peritonitis and phlegmonous inflammation of the cellular tissue of the pelvis.

In some of the fatal cases in which drainage of the peritoneal cavity had been employed, the post-mortem examination showed that this drainage had been frustrated by the pliable walls of the intestines and still more mobile and pliable omentum which had occluded the openings in the drainage-tubes, above which large accumulations of septic fluid had formed. On this account Mikulicz came to the conclusion that it was impossible by any method known up to the present time to make effective drainage of the peritoneal cavity. From an *à priori* pathologico-anatomical point of view, I shall most certainly agree with him in this respect; but there is always some dissension between *à priori* reasonings and facts, as the statistics have shown that Bardenheuer's drainage through the vagina is a valuable factor in making Freund's operation, that is, the abdominal method of total extirpation of the uterus, considerably less fatal.

It occurred to me that permanent irrigation would be the safest method in my case, in which the bladder had been opened, and I consequently used a permanent irrigator, made exactly after the pattern of Mikulicz's, as shown in the cut in his above-mentioned paper.[1]

[1] Wiener Medizinische Wochenschrift, No. 4, 1881, p. 96.

As I found in the course of the after-treatment some inconveniences of minor importance attendant upon the use of Mikulicz's irrigator, I shall here, for the sake of brevity, describe the modified instrument I propose to use. As shown in Fig. 2, it consists of a cylindrical vaginal speculum,

Fig. 2.

VAGINAL IRRIGATOR (half of natural size).—A. SPECULUM, *lateral view*.—1. Handle, through the ring of which any cylindrical body, for instance, a vaginal dressing forceps, can be pushed for getting a firm hold. 2, 2. Rings for the bands for attachment of the apparatus to abdominal cincture. 3. Lateral screws to fasten the cover. 4. Small spring for attachment of long ends of ligatures around the broad ligaments. 5. Small holes through the internal half of speculum. 6. Nuts.

B. COVER.—1. Afferent tube with 2. Screw. 3. Stopcock, and 4. Terminal bulb with small openings. 5. Efferent tube. 6. Openings for overflow tube. 7. Hole for lateral screw.

Note.—The cover does not fit tightly to the speculum, but is made air tight by means of rubber washers.

the central end of which is compressed and flattened so as to terminate not in a circular but in an oval opening, the transverse diameter of which is the longer, and of the same length as the diameter of the tube. The internal half of the speculum is perforated by a large number of small holes cut close to one another. Mikulicz's irrigator has a small number of large holes, through which the œdematous mucous membrane of the vagina protruded a few days after the operation, forming polypi, which not only made every movement of the instrument painful, but made its removal extremely difficult. At the outer end of this speculum, at its upper and lower aspect, in the median line, are rings through which bands are passed, which are attached to a cincture around the abdomen, for the purpose of retaining the instrument in position. At the free border of the speculum are two small hooks, for the attachment of the long ends of the ligatures around the broad ligaments. To the upper external border of the speculum is attached a small handle, which steadies the speculum and tends to keep it immobile while the cover is being removed or replaced. A watertight cover is fitted accurately to the outer end of the speculum. Through the centre of this cover passes the metallic afferent tube, terminating in a bulb having numerous small perforations. Below the afferent tube is a short efferent tube, which originates in the cover. To each of these tubes rubber tubing is attached; that of the afferent tube communicating with a vessel half a metre above the level of the vagina, containing the irrigat-

ing fluid; that of the efferent tube discharging into a vessel placed on the floor by the bed-side. The irrigating fluid passes down through the afferent tube, out through the holes in the speculum, irrigates the wound, fills up the speculum, and passes out through the efferent tube. To avoid any undue pressure upon the wound from too sudden an influx of fluid, or by the occlusion of the efferent tube by clots of blood or the débris of eliminated tissue, there is a hole in the cover above the afferent tube, through which the fluid may pass out when the speculum is entirely filled.

The disinfecting fluid used for permanent irrigation has been in all the cases on record, two of Billroth's and my own, a one-tenth of one per cent. solution of thymol. But there is no reason why a solution of salicylic acid, such as Volkmann makes use of after extirpations of the rectum, or of boracic acid might not be employed with as good results. Constant irrigation with a solution of carbolic acid cannot be recommended, even as an experiment, as it might prove dangerous by its absorption and the consequent carbolic acid poisoning.

In the afferent rubber tube, between the reservoir and the vaginal irrigator, it is well to have a stop-cock so as to regulate the influx of the irrigating fluid, which should be a rapid succession of drops and not a constant stream, as this would cause an unnecessary and inconvenient waste of the fluid, necessitating the too frequent refilling of the reservoir and consequent inconvenience to the nurse.

As Billroth, Mikulicz, and I applied the irrigator, we had to contend with several inconveniences, which should be avoided in the future. These inconveniences are the following: The patient was obliged to lie the whole time on a rubber bed-pan, because the whole amount of irrigating fluid was not carried away through the efferent tube, but some of it escaped through the reserve opening above the afferent tube and some of it passed out between the speculum and the vulva. Notwithstanding very careful nursing, and the intermittent emptying of the fluid in the bed-pan, it happened to us and always will happen, especially during the night, that the bed-pan overflowed and the whole of the bed got wet. As the bed and night clothing of the patient cannot conveniently be changed more than once or twice in the twenty-four hours, especially during the first days after the operation, the wetting of the sheets and the whole back of the patient was unavoidable. The consequence of this was acute eczemas on the back, accompanied by an itching which soon became very uncomfortable to the patient, causing not only loss of sleep, but also in all probability a slight rise in temperature. I think that these inconveniences may be avoided by using a bed-pan having an efferent tube, by means of which the bed-pan may be kept empty all the time.

But there is still another point. For some patients, mine for instance, it is inconvenient to remain all the time on a rubber bed-pan, when this is placed on the mattress, because the bed-pan being on a higher level than

the mattress surrounding it exercises an augmented pressure on the part of the sacrum that rests upon it, a pressure sufficient to cause, even in favourable cases, small superficial bed-sores, accompanied by considerable pain. I shall therefore, in future cases, have the bed-pan for permanent use situated in a fitting depression of the mattress, so as to make the upper surface of the bed-pan on a level with the latter. By precautions such as these just mentioned, I think it will be possible to keep the bed dry during the permanent irrigation.

The temperature of the irrigating fluid should be, as a rule, the temperature of the blood. In my own case the patient wished at times to have the fluid cooler. This request was attended to, and it appeared to relieve the pain in the wound.

As to the duration of the permanent irrigation: it has always been employed for about a week, within which time the peritoneal wound will be satisfactorily closed, and the vaginal wound granulating, so as to make the occurrence of any later absorption of septic matter impossible, and so as to render further constant irrigation unnecessary.

The cover of the vaginal irrigator should be removed three times a day for the removal of clots and portions of tissue sloughed off from the ligated lateral ligaments, and for the cleansing of the afferent and efferent tubes with five per cent. solution of carbolic acid. As any movement of the irrigator will cause the patient pain and consequently make her nervous before and after the removal of the cover, I have added, as mentioned above, a handle to Mikulicz's speculum, to make it possible to remove the cover without moving the vaginal tube in the least. The central end of Mikulicz's irrigator is cylindrical and cut off obliquely. For this oblique termination there is no use after the uterus has been removed, and the cylindrical end of the tube should rather be a transverse oval, because the wound in the peritoneum will always be transverse.

After having considered the advantages and disadvantages of the two methods of drainage and disinfection described above, I shall state as my opinion that I shall employ in future cases either of these methods, their use being based upon the following considerations: In common, uncomplicated cases, in which neither the bladder nor rectum has been opened, and in which there is no specific cause to fear septic inflammation, I shall make use of drainage-tubes, as Schröder does, but, of course, only for the vaginal wound, as I shall invariably insist upon the immediate uniting of the peritoneal wound.

In cases in which the bladder or rectum has been opened, I shall invariably employ constant irrigation, because we can never be sure, even after the most careful closure of openings into these organs, that the wounds will unite by first intention. We know from a number of cases on record in which openings in the intestines have been united with sutures, that escape of some fecal matter has frequently taken place, for a

short time, even in favourable cases. We know, further, that, after the *sectio alta* of the bladder, when performed with the most strenuous antiseptic precautions, in most cases a small quantity of urine escapes through the wound for a short time, followed by spontaneous closure of the small openings in the wound which had not united by first intention. Exactly the same imperfect union of the wound in the bladder by first intention occurred in my case, as has been shown in the history. The small fistula closed spontaneously in a little more than four weeks after the operation.

With these facts in view, it seems to me natural in such cases not to trust to drainage-tubes, with only periodical removal of the fluids and substances in and around the wound, but rather that constant irrigation is the only rational way to effect the removal of any urinary or fecal matter.

The opening of the bladder renders necessary certain especial measures, besides the treatment already mentioned. The main feature is the retention of a permanent catheter in the bladder. Without going too fully into details, I shall simply state that I have found the use of a soft elastic rubber catheter to be the most convenient. In the avoidance of irritation and subsequent cystitis by this procedure, I consider the following factors of great value: First: The washing out of the bladder once or twice daily with a lukewarm saturated solution of boracic acid. Second: The end of the catheter terminating directly or indirectly through a tube in a vessel filled with five per cent. solution of carbolic acid; by means of which only disinfected air can come in contact with the column of urine from the bladder. By careful attention to these precautions, I have been enabled in this as well as in other operations, perineal section, for example, to retain the permanent catheter in the bladder for more than two weeks without causing any irritation sufficient to necessitate its removal. Where the urethra is healthy, as in cases of extirpation of the uterus, I remove the catheter twice a day, in order to cleanse it by the use of five per cent. carbolic acid solution.

A permanent tube in the rectum, a large, soft rubber tube, with several holes cut in the sides, is of great help in the facilitation of the passage of the intestinal gases. It is needless to say that any accumulation of the latter, in cases of abdominal operations, causes great pain to the patient, which is speedily relieved by their escape. This tube should be taken out and cleaned every one or two days, as the mucous matter of the rectum becomes very tenacious, and will adhere to the tube and occlude the holes if not frequently removed.

As to passages from the bowels. It is natural that we desire to keep the bowels perfectly quiet until the peritoneal wound is entirely united. In common, uncomplicated cases, the bowels have been moved a week after the operation without inconvenience. In my own case I did not dare or wish to have the bowels moved until very late in the after-treatment, on account of the opening into the bladder, with a view of not dis-

turbing the healing of the latter if it could be avoided. As the history shows, I had no difficulty in postponing the movement of the bowels until even sixteen days after the operation, notwithstanding that the patient took considerable liquid food during the whole of the time, and, toward the latter part, even small quantities of solid food.

As for the medical treatment after the operation, I have very little to say in addition to what is already known from other abdominal operations. To keep the patient free from pain and restlessness I use hypodermic injections of one-sixth to one-fourth of a grain of morphia; moderate doses of quinia when a rise in temperature occurs; camphor and opium pills for the tenesmus and pain in the bladder; sub-nitrate of bismuth, with or without morphia, for pain in the cardiac region; and iced champagne and bits of ice for nausea.

The ligatures around the lateral ligaments will generally loosen and come off in the course of two or three weeks; sometimes one or more of them will remain for five or six weeks, as happened on one side in my own case. Inconveniences of this kind we may desire to avoid, and consequently, in cases in which the lateral ligaments are long enough, we should avoid the ligature *en masse* entirely. Local granulating nodules, especially in the lateral portions of the wound, may remain for a considerable time after operation. These may easily be made to heal by superficial cauterization with nitrate of silver, tincture of iodine, or similar agents.

If the course of the after-treatment is favourable, the patient will be able to be out of bed in three weeks, and up and around the house in four or five weeks. It is needless to state that during the convalescence, iron, wine, and food of the most nourishing character, should be given to those patients who are anæmic from constant loss of blood for months previous to operation; under this treatment the patients will gain strength rapidly.

IV. *Results and Remarks.*

We must naturally ask ourselves: Does suffering humanity gain anything by this operation? or, in other words: Does the operation enable us to save, or only to prolong life, and is it worth while for patients having uterine cancer to undergo this severe operation?

By total extirpation of the uterus, we desire to gain something more than the mere cessation of fetor and hemorrhage from the vagina, because we can obtain this by partial and very much less dangerous operations. We want to obtain perfect recovery if possible, or, at any rate, health for some years, to compensate for the serious operation.

In making a total extirpation of the uterus for cancer, we have the right to expect nothing more and nothing less than from the extirpation of cancer in other portions of the body. The immunity of the patient from a relapse of the cancer depends partly upon the anatomico-physiological characteristics of the malignant growth, and partly upon the successful re-

moval of all the diseased tissue by the operation. From the statistics of the cases operated upon, we learn that in about fifty per cent. of the cases, relapse of the cancer set in *in loco* within a few months after the operation, and in regard to the remainder, the successful operations, the period since the operations had been too short to admit of our learning anything about definite cure. We do not need to be reminded, however, that the removal of malignant tumours in almost any part of the body except the ovaries is, and has always been, regarded as a procedure which the surgeon undertakes rather as a kind of traditional duty, than from any hope of thereby gaining for the patient radical cure, or even, in all cases, a longer lease of healthy life.

The prospects for patients operated upon for cancer we have always considered very gloomy. We did not know the exact numerical expression of what benefit we might expect to derive from the extirpation of cancers, until the recent statistics of Winiwarter, from the material of Billroth, at Vienna; Oldekop, from Esmarch's material at Kiel, and Henry, from Fischer's material at Berlin, threw some light upon the subject. The extirpation of cancers of the mammary gland gave a permanent cure in nine per cent. of the cases. The statistics of twenty-nine cases of cancer of the tongue, pharynx, and rectum, reported by Kocher, gave thirty-one per cent. of radical cures.

Mikulicz is certainly right in expressing the hope, or rather the justifiable expectation, that modern surgery will enable us to ameliorate the statistics of the radical treatment of cancer, for the following reasons: We have now the right, aided by antiseptic surgery, to operate much more extensively; to have, I may say, no apprehensions as to the size, location, and extent of the wound inflicted, within the limits for operations on vital organs, established by anatomy and physiology, the transgression of which would cause immediate death. In other words, we need not care how near we come to vessels or nerves or the intestines, because we need be no longer afraid of endangering our patients' lives by secondary inflammations in such important organs, since it is in our power to prevent any and all such complications by sufficient skill and care.

We may consequently, in operating for cancer, do justice to one of the imperative conditions recognized from the olden time to be all-important, namely, the removal of every particle of diseased tissue, and expect in years to come to have a much larger proportion of permanent cures after the extirpation of cancers.

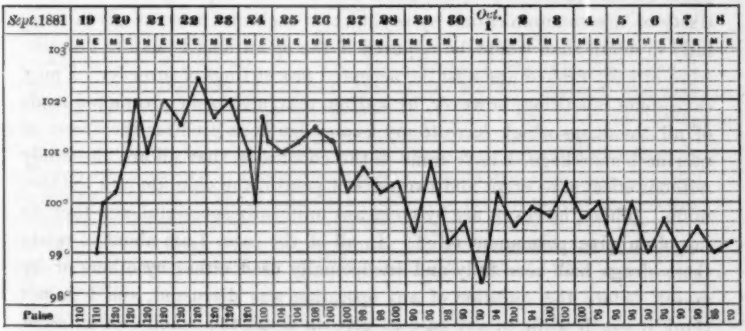
Now let us see how this applies to the total extirpation of the uterus through the vagina. If this operation were, or might be in the future made as safe as ovariotomy now is in the hands of the best operators, or, as might not unreasonably be expected, almost as safe as the supra-vaginal amputation, we might then be justified in preferring the former to the latter method, for the more effectual removal of all the diseased tissue.

The vaginal extirpation, for instance, enables us to remove the spread nodules and infiltrated lymph glands from the broad ligaments and the pelvic cellular tissue. But the operation has not yet reached such a degree of perfection and consequent safety, that we are justified in substituting it for the less dangerous supra-vaginal amputation, and so much the more as the latter counts among its results some cases of permanent recovery, besides the numerous cases in which the patient's condition was sufficiently ameliorated to give her a longer period of happy existence in her family, enabling her, for a time, to resume domestic duties.

On the other hand, the material existing, and the results so far obtained, have won for this operation a higher position than that accorded to it by John Erichsen, in his address before the Surgical Section of the International Medical Congress,[1] in which he chooses to designate such operations as "surgical triumphs or operative audacities, applied to the diagnosis or cure of diseases, in which but little of ultimate advantage, and, certainly, much of immediate peril may be expected from operative interference."

In natural science, we have no right to expect anything good or bad, without asking nature the right questions in the right terms. What the final answer to the question asked regarding the vaginal extirpation of the uterus for the cure of cancer will be, we do not know. But with sufficient skill and in careful hands this operation does not involve an amount of unavoidable danger considerable enough to prevent us from being justified in resorting to it when indicated in a disease which we know to be necessarily fatal, and with full confidence in our ability to make the method of operation still more perfect, and so lessen its dangers—a result which can be obtained, not by sterile *à priori* reasonings as to the right of its existence, but only by an earnest and impartial trial.

The accompanying chart shows the temperature curve in my case (see page 19).



[1] Lancet, No. 6, vol. ii. 1881, p. 227.

ARTICLE II.

REMOVAL OF UTERINE APPENDAGES FOR THE ARREST OF UTERINE HEMORRHAGE. BY LAWSON TAIT, F.R.C.S., Surgeon to the Birmingham and Midland Hospital for Women, etc., Birmingham, England.

IT is to be expected that any new proposal in surgery will meet with a keener and more careful scrutiny the more exact our professional methods of argument become, and it is right that every method of testing new proceedings should be employed, and most of all the statistical method. The introduction of this is of very recent date, and had it been employed earlier, there are many operations, still in occasional use, which would long since have received complete professional condemnation.

No operation had so hard a battle to fight as ovariotomy, and it certainly would not yet have received complete acceptance but for the application to it of a careful statistical method by Mr. Spencer Wells. The greatest difficulty with it arose chiefly from sentiment, due to the facts that its objects were women, and that its relations were purely sexual. It was only when it was finally shown that its results could be compared favourably with those of every other major operation in surgery that the opposition was broken down.

The successful removal of ovarian tumours of necessity led to further efforts in abdominal surgery, and recent publications have shown that immense advances are yet possible in this department, but if these advances are to be made, those who are venturesome enough to make the first efforts must have something like fair play, and their results must be heard and carefully weighed before their work is condemned. I now desire to lay my experience upon one particular departure of a new kind in complete detail before the profession in order that I may obtain from their decision a guide for the future for myself and others. I must apologize for the prolixity of my communication by saying, that each case must be given more fully in detail than would be required if the operations I have to describe were already ranked amongst the accepted proceedings of surgery. I may save some repetition, however, by stating, that, after very protracted trials of all the drugs which have to my knowledge been used for the arrest of uterine hemorrhage, I have come to the conclusion that all are absolutely without effect save ergot and two salts of potash, the chlorate and the bromide. These, however, are by no means uniformly successful, and they do not often give permanent relief. In all of the cases I am about to relate these drugs had been fully and ineffectually used either by others or by myself before the question of any operation was discussed, and I do not think it worth while in any case to give in detail the infinite varieties of drug treatment which these patients were otherwise subjected to.

The cases are thirty-one in number, and in four of them the operations

had fatal results, and they include every case where I have operated for hemorrhage. In the cases which have recovered from the operations, that is those in which there was primary success, the secondary results have been somewhat various, bnt only in one have they been unsatisfactory, and the explanation of this is that I operated for hemorrhage due probably to malignant disease, a mistake sure to occur occasionally in the most experienced hands. Even in this case, however, I procured the patient three months of relief from the hemorrhage.

I have entitled my paper "On Removal of the Uterine Appendages," because my experience seems to me to point very clearly to the conclusion that mere removal of the ovaries is not a certain method of arresting menstruation, whilst removal of the tubes as well as the ovaries seems to be so. This latter point, however, is one requiring further evidence, though I think we may fully accept the other part of my statement.

CASE I.—E. R., aged 41, the mother of four children, consulted me in June, 1873, on account of profuse menorrhagia, which had been in existence for fourteen months, was becoming rapidly more serious, and had reduced her to a condition of marked anæmia. On examination, I found that the uterus was normal in size and pushed over to the left side, but that it was associated with a tumour about the size of a cocoa-nut, which was evidently cystic, and, from its attachment to the uterus, was probably ovarian. I placed her upon a treatment consisting of large doses, fifteen grains, of bromide of potassium, with ergotin, one grain, in order to check the hemorrhage. For this purpose, I also applied astringent and caustic applications to the interior of the uterus, but all to no effect. The menorrhagia continued quite as profuse till September; and then, as it became perfectly evident that something more must be done, I resolved to remove the tumour. This I did on September 9, 1873. I made the usual median incision, and, when the tumour was displayed, I found that it was an ovarian cyst on the right side, with no very well-defined pedicle, and with a number of very large sinuses in its walls. I tapped it, and removed it from the pelvis, drawing it well out, and then I applied a circular clamp as close to the uterus as I could. A small mass of secondary cysts was pulled above the clamp with great difficulty, and the clamp was fastened really round a part of the cyst. The patient did remarkably well after the operation. On the seventh day, the clamp began to separate, and then it became evident that the part of the cyst cavity which remained was suppurating, and it discharged large quantities of pus. On the twelfth day, the clamp came off. For about a month after the operation, the cavity discharged freely, but then the opening began to close, and the patient suffered much pain. I, therefore, passed a double drainage tube through the cavity, and left it there about six weeks. I then removed it, and the whole track closed in a few days, and the patient remains to this day permanently well. Ever since the operation, her menstruation has been perfectly regular, and normal in quantity, and now (April, 1881) she is in robust health.

The only explanation of this curious case upon which I can venture is, that the metrorrhagia must have been due to the large venous sinuses which I found in the tumour. One or more of these probably ran through

the corner of the uterus, and thus contributed a supply of blood larger than usual. That the removal of the tumour, leading to the destruction of these sinuses, cured the metrorrhagia, strongly supports my hypothesis.

CASE II.—Of the first case in which I removed *both* ovaries on account of uterine hemorrhage I can, unfortunately, give only a brief outline from memory, as the notes of the case have been lost, and I have nothing left save the record of the operation, which was performed on May 22, 1873. The patient, E. C., aged 40, was placed under my care by Mr. Giles, of Stourbridge, with a myoma about the size of a child's head, and from which she had for a long time had profuse monthly hemorrhages. I removed both ovaries, tying the pedicles, and the patient made an easy and rapid recovery. Menstruation did not occur after the operation, and the last I heard of the patient was that she was living in Cheltenham, in 1876, in robust health.

CASE III.—E. T., aged 41, single, was sent to me by Dr. Raper, in April, 1873, an account of extreme anæmia, the result of profuse menorrhagia. She presented an appearance as if every drop of blood had left her face. She had noticed a lump in the lower part of the abdomen for some months, and during her menstrual periods this lump was the seat of severe pain. When examined, this was found to be a tumour reaching almost up to the umbilicus, free, movable from above, soft but not fluctuating, and attached undoubtedly to the uterus. This organ was high up, and somewhat behind, the tumour, and to the right side.

The nature of the tumour was not clear, but I placed in my note-book an alternative diagnosis of a soft pedicellated uterine myoma, or an ovarian cyst with thick contents. I determined to remove the tumour.

On May 22d she was placed under the influence of methylene ether by Dr. Raper, and I was further assisted by Dr. James R. Chadwick, of Boston, U. S. A., and Mr. W. J. Foster. I made an incision four inches in length, and displayed a tumour of bright, pearly lustre, but having a curious purple hue, such as I had not previously seen. To the touch, it had a most singularly heavy and doughy feeling, and, when punctured by the trocar, nothing passed through the tube. I, therefore, made an incision into the cyst, and squeezed out a quantity of dark purple stuff of a putty-like consistence. I was thus able to draw the tumour out through the wound, and, finding that it had a well-marked pedicle, I secured it by a clamp, and finished the operation in the usual way. The other ovary was perfectly healthy, as was also the uterus.

The patient recovered from the operation without any trouble, and has since remained quite well, though she has never menstruated, and has suffered from the usual climacteric distress. When I came to examine the cyst and its contents, I found that the latter consisted entirely of inspissated blood, and the source of that blood was evidently a large ulcerating surface, which existed on the inner wall of the cyst. I think it very likely that the cyst originally contained the ordinary albuminous fluid found in such cavities; but that when this ulceration occurred, the walls of the Graafian capillaries gave way, especially, perhaps, at the menstrual periods, and hemorrhage into the cyst occurred. In the intermenstrual period, it is likely that absorption of the liquor sanguinis occurred, and thus the peculiar putty-like contents of the cyst were manufactured. This, of course, does not explain the occurrence of the uterine hemorrhage; and upon this matter I am unable even to speculate. There can be no doubt that the tumour was directly the cause of the hemorrhage, because

it ceased absolutely upon its removal, but it is impossible to see how hemorrhage into a cyst should involve hemorrhage from the uterus.

CASE IV.—This was a patient of Messrs. Horsfall and Whiteley, of Wakefield, whose ovaries I removed upon the 25th of December, 1873, on account of uncontrollable hemorrhage from a myoma, about the size of the fœtal head. The patient was extremely anæmic. I divided the broad ligaments by the cautery, the patient had no efficient nurse and insisted upon getting up to the stool next day, and in the act of defecation, died. No post-mortem was made, but I have little doubt that she died of hemorrhage, for in subsequent cases I have found it wholly impossible to arrest the bleeding securely in such an operation by the cautery, and have satisfied myself that in the ligature alone there is safety.

CASE V.—This was a case operated upon in the Hospital for Women, on March 14, 1874, for hemorrhage from a small myoma. The patient died of septic peritonitis on the fourth day.

Discouraged by the deaths of two out of these three cases, I did not repeat this operation till 1879, and in the mean time tried a variety of operations, as enucleation and hysterotomy, for these cases of bleeding myoma. My results of these proceedings (already published) have, however been so bad, that I have determined to do no more of them, for they appear to me to be wholly unjustifiable. I was encouraged to resume the operation of removing the ovaries by an increasing success in my operations for the removal of ovarian tumours due to the re-introduction of the intraperitoneal method of operating by Dr. Keith, to increased personal experience, and to the arrangement of a more healthy hospital. Since 1879 I have performed this operation twenty-six times with two deaths, or a mortality of 7.7 per cent.

CASE VI.—E. F., aged 21, sent to me in January, 1879, by Dr. Meredith, of Wellington, in Somersetshire, on account of intractable menorrhagia of a very profuse kind. The girl was extremely anæmic, and after each menstruation was greatly exhausted. The history she gave was that the periods began when she was fifteen, and were regular and of normal amount till 1877, when they became excessive. The periods often lasted for nearly three weeks, in fact were nearly continuous. Every kind of drug treatment had failed. On examination I found the uterus nearly normal in size and position, but the ovaries were large and very tender. I fully dilated and explored the uterus on January 20th, but found nothing. I applied solid nitrate of silver all over its interior, and this was repeated at intervals seven times during her residence in the hospital. The other treatment consisted of complete rest in bed and the administration of large doses of bromide of potassium and ergot. She had three periods during her residence with us, and returned to Wellington on March 1st. When at home, however, her condition speedily got worse again, and in spite of Dr. Meredith continuing the treatment, including the intra-uterine applications, she rapidly became worse, and returned to us in August to have the ovaries removed. This decision was arrived at after much correspondence between myself and Dr. Meredith with the full knowledge on the part of the patient and of the friends, as to what it was we proposed, and all its possible consequences, and also after full consultation with my colleagues on the hospital staff.

The operation was performed on August 8, 1879, at the Hospital for Women, in the presence of Dr. Annie Barker, Dr. Agnes McLaren, Dr. Savage, Dr. Adginton, and Mr. Raffles Harmar, my assistant. Ether was given by Dr. Annie E. Clark. A median incision, four inches in extent, was made; the ovaries were found adherent to surrounding structures, were studded with small cysts, and were covered with flakes of recent lymph. A good deal of care had to be exercised in separating them. The tubes were adherent to them, and were removed with them, the pedicles being secured in the way I have described (*Brit. Med. Journal*) under the name of the "Staffordshire Knot." I have used that knot now 161 times, without having in a single instance found it to fail. She recovered from the operation without trouble of any kind, a very slight show occurring on the 16th and 17th. She left the hospital on August 31st. She has never menstruated since, and I exhibited her at a meeting of the Somersetshire branch of the British Medical Association in August, 1880, when she was in perfect health, could walk any distance, and suffered no kind of discomfort, the climacteric symptoms having entirely disappeared. She remains up to the time of writing, twenty-one months after the operation, in perfect health.

Of this case I can only say that all concerned in it are quite satisfied that but for the operation the girl would have lost her life from hemorrhage." Whether the hemorrhage depended upon the cystic condition of the ovaries, upon the perioöphoritis, or upon the inflammation of the tubes, I do not know, but on account of the evidence of other cases I am inclined to attribute it to the cystic disease of the ovaries.

CASE VII.—This case was placed under my care by Dr. Larkin, of Bilston, and was operated upon August 28, 1879, and was then in a condition of the most extreme spanæmia from profuse and protracted menorrhagia due to a large myoma. Within a few hours after the operation she became breathless, and died in thirty hours of suffocation, due to the formation of heart clot. This deposit was found to extend from the point of ligature up to the heart, and to occupy all the chambers. In the publication of the case already made I have expressed my regret at having undertaken the operation under circumstances almost devoid of hope, and I certainly would not repeat the attempt in such a case.

CASE VIII.—This case was under the joint care of Dr. Wellersley Tomkins, of Leamington, and Dr. Crowe, of Worcester. She had had one child, twenty-three years ago, and had suffered from menorrhagia for about ten years. For five years the losses had been profuse. I saw her for the first time in February, 1878, and recognized the presence of a multiple myoma. Treatment by drugs was persevered in till October, 1879, when it became evident that something more certain must be undertaken, and I recommended removal of the ovaries. This was performed on October 18, 1879, in the presence of her attendants, and with the assistance of Mr. Raffles Harmar I removed both ovaries and both tubes. The ovaries were cystic and the tubes so related to them that they had to be removed to get a good pedicle. Dr. Tomkins's report of the progress of the case is that "she progressed without pain or drawback of any kind till fourteen days after the operation when, unfortunately, having been lifted on to the sofa, for the purpose of having her bed made, in the absence of her nurse, she incautiously stood up on the cold floor for a few minutes, with the re-

sult of being attacked with severe pain in the left iliac region two hours afterwards, extending down the course of the vein." This turned out to be an attack of phlebitis, which materially protracted her convalescence. Dr. Tomkins wrote, on the 20th of November, "Her condition to-day is eminently satisfactory. She is quite free from pain, eats heartily, and sleeps well, looks cheerful and happy, quite different from the haggard and careworn appearance she has presented for years. The left leg is rapidly regaining its shape and proper proportions." On May 18, 1880, I saw her with Dr. Tomkins at Leamington, and found her in perfect health. She had had no return of menstruation, and suffered only slight inconvenience from her leg, and now she is quite a robust woman.

CASE IX.—This lady was the widow of a very well-known member of our profession, and she was placed under my care by his two sons, who are both widely known in the Midland district, and for every step of the treatment of her case I had their complete sanction and most earnest assistance (Drs. J. H. and E. Tylecote, of London). In December, 1876, I discovered a myoma to be the cause of an intractable menorrhagia, which had entirely destroyed her health and reduced her to a condition of extreme anæmia. We used a great variety of methods of treatment without avail, including a prolonged use of ergotin administered hypodermically; the use of strong astringents and escharotics into the uterus, and finally (in April, 1879) the free division of the cervix. Her age (52) induced us to defer any further step under the hope that the natural process would affect an arrest of the hemorrhage, but it did not; so that in November, 1879, when she was so terribly reduced that all chance of success seemed gone, and so hopeless did the prospect of the climacteric become, that I proposed removal of the ovaries almost against my own conviction. This operation I performed on November 30, 1879. She made a somewhat difficult and tedious recovery. In February, 1880, she had greatly recovered her strength, the hemorrhage having been completely arrested though certain faint indications of menstruation had occurred. In this case the tubes were not interfered with. On the anniversary of her operation, 1880, she wrote to me that she had occasional and only slight shows, but that she was "in perfect health; was leading a very busy life." On May 22, 1880, she wrote, "I am a marvel to myself and others, to find myself again with old friends, and able to do pretty much as others do. It seems as though one was taking a new lease of life." Occasional but very slight menstruations still occur, but she is in perfectly robust health, and the tumours have almost disappeared. A few weeks ago she wrote to me that she was anxious to undertake the charge of an important hospital work in which she had been engaged up to 1875, when her hemorrhage obliged her to give it up.

CASE X.—This was a hospital patient, had been married nine years, and had never been pregnant. Her menstruation had always been regular, but six years ago it began to get excessive, and the amount of loss was steadily increasing. Her periods lasted quite a fortnight, and during the whole time she suffered excessive pain. She had been under the care of a number of doctors, including two well-known gynæcologists, without obtaining any relief. A tumour was observed in Nov. 1878, and until Jan. 1880, she took bromide of potash and ergot almost uninterruptedly, but without benefit; indeed she became rapidly more anæmic. I therefore determined to remove the ovaries, and this I did on Jan. 13, 1880. Both ovaries were cystic, and there was no possibility of removing them without the

tubes. The myoma was as large as an ostrich egg. She recovered without interruption, and left the hospital on Feb. 13th, greatly improved in health. In July, 1880, she had one slight show after a long railway journey, and has seen nothing since. She is now stout and of a ruddy complexion, has lost all the climacteric disturbance, and her tumour seems to be about one-third the size it was at the time of the operation.

CASE XI.—This was also a hospital patient. She had been quite regular until five years before I saw her, but since that time the periods had come on every fortnight and became gradually very profuse, so that for the last three months of 1879 it was practically continuous. She was extremely anæmic and worn down, and suffered great pain, and she had been under a number of doctors without getting any relief. I found a multiple myoma and advised the removal of the ovaries. This I performed on Jan. 17, 1880. I found the right ovary cystic (it is now in the College of Surgeons Museum), the left completely cirrhotic, and both tubes had to be removed to get proper pedicles. She made a rapid and easy recovery and left the hospital early in February. On March 3d I saw her and found her greatly recovered. She had gained flesh and colour and expressed herself as being better than she had been for years. She returned to Southport and remained perfectly well for about three months and then became ill and died. I have applied to the practitioner under whose care she died for particulars, but I am sorry to say I have not been able to get them. All I can learn is that the certificate of death had the entry of "Cancer of the Uterus," and the symptoms described by her friends correspond to this. The tumour at the time of the operation did not present any appearance of malignancy, as if being anything but an ordinary multiple myoma, about as large as a cocoa-nut. But it may have been malignant at that time. On the other hand it may have become malignant after the operation, though it can hardly be suspected that it did so as a result of the operation.

CASE XII.—This case was placed under my care by Mr. R. A. Newton, of Newhall Street, Birmingham, and in its results is one of the most brilliant I have ever experienced in the whole course of my practice, for the operation restored a woman, whose life was slowly being destroyed, to a condition of perfect activity and usefulness. Her menstruation began at the age of thirteen, always regular but very painful, and she never was able to sit up during her periods, being almost always confined to bed. She was married in 1876; and marriage greatly increased the severity of her sufferings. She became pregnant three months after marriage, and had a very long and severe illness after her confinement. Her second confinement took place early in 1878, and she had hardly been out of bed for the eleven months which elapsed between it and my first seeing her with Mr. Newton. My first visit to her was in May, 1879, and I found her with large, tender ovaries down behind the uterus, the fundus of which was retroverted and exquisitely tender to the touch. Her menstruation was extremely profuse, and she was very anæmic and suffering from hectic symptoms. Marital intercourse had always been painful to her, but since her last confinement she could not endure it at all. She had been under a great variety of treatments, from none of which had she been benefited in the least. No pressure could be endured. I did not see her again until January 6, 1880; and between my visits others had been consulted without result. When I saw her the second time I was fully persuaded, as was Mr. Newton, that she had not long to live if something could not be done

to relieve her. I proposed to remove the diseased ovaries, and that was at once accepted by Mr. Newton and her friends—somewhat reluctantly by the former. I operated on February 9th, and found the ovaries greatly enlarged, adherent, and covered by recent lymph. I removed the tubes with them. She made a speedy recovery and has never menstruated since. In a few weeks she was able to walk with assistance, then she rapidly gained strength, and now (May, 1881) enjoys health, such as she has never known in her life before; strong, robust, and wholly free from pain. Further, she tells me, that, while previous to the operation, she never submitted to marital intercourse without dread, and from it never derived anything approaching pleasure; now she has altogether different sentiments regarding it and derives from and confers upon her husband perfect satisfaction. This fact is also established concerning many others of my cases, but it is not a matter concerned in this paper, and those who argue against removal of the ovaries on the ground that it unsexes a woman, are profoundly ignorant of the physiology of the female sexual organs.

CASE XIII.—This patient was placed under my care in February, 1880, up to which time she had been under the care of Dr. Graily Hewitt. Her menstruation began at 12, and remained regular and comparatively free from pain till she was about 28. After that her periods gradually became more and more profuse till she was 36. Previous to my seeing her she had been wholly unable to walk for seven years, and had practically been confined to bed or to the couch for that period. She had been under many doctors, and for four years under one distinguished specialist without the least improvement. I found the uterus retroflected, the fundus enormously enlarged and spongy, and the ovaries lying down with it, both enormously enlarged. Everything had been already done which could be suggested, by drugs and pessaries, fruitlessly, and she had come prepared for removal of the ovaries. This operation seemed to me the only thing to be done, and the anæmic state she was in justified it for the arrest of the hemorrhage alone. I operated on her in February 20, 1880, and found both ovaries enormously enlarged and with them I removed the tubes. I also passed a stitch through the fundus of the uterus and fastened it up to the wound. She made a rapid recovery from the operation, and soon gained strength and colour, for she has never menstruated since. Her powers of locomotion, however, were slow to be re-established. She wrote me in October, 1880, eight months after the operation, that she could only drag herself along with sticks, and we almost gave up hope that she ever would mend in this way. In March, 1881, however, the long hoped for change came, and now, fifteen months after the operation, she can walk freely and without support, is free from pain, looks stout and well, and is in a condition of health as good as she was eleven years ago.

CASE XIV.—This lady was sent to me by Mr. Calvert, of Southwell, for distressing pelvic pain, profuse menorrhagia, and pronounced anæmia. The periods occupied the greater part of the month, and were very profuse. Ergot had exercised no influence upon them. I found she had a multiple myoma, and from her age I was averse to operate, hoping that nature would help us in arresting the periods. I therefore kept her under observation for seven months, and it was only (as in Case IX.) when it became evident that there was risk in a longer delay, that I suggested the removal of the ovaries. To this her attendant, who was also a very near relative, at once consented and I operated on March 10, 1880. The ovaries were down behind the tumour and were very difficult to reach, and the tubes

were removed with them. She made an uninterrupted recovery, and speedily gained flesh and colour. She has never menstruated since. I have seen her quite lately, and am perfectly satisfied with the results of the operation. The tumour has greatly diminished in size.

CASE XV.—In this case, brought to me by Dr. Clifton, of Leicester, the periods had been getting gradually profuse for about ten years. Of late, they had occupied the greater part of the month, she being rarely fourteen days clear. Sometimes there would be continuous loss for several weeks, and ergot and bromide had been fully tried without any perceptible effect. She was very anæmic, and had great difficulty in walking. I found, on examination under ether (she was unmarried), that there was a multiple myoma about as large as a cocoa-nut. I advised the removal of the ovaries. They were both cystic, and quite as large as a walnut. The tubes were also removed. She recovered rapidly from the operation, and has never menstruated since. She is now stout and ruddy, but she has suffered a good deal from the climacteric. She can walk well, and doubtless in a few months will be in perfect health. All these cases I ask to see me, or write to me, once a month for a period of two years after the operation. In the last letter of this patient, she says: "I shall probably not write again without there is something I want to consult you about."

CASE XVI.—The next case was that of a lady, aged thirty-three, placed under my care by Dr. Gibbs Blake, of Birmingham. She began to menstruate at thirteen, was married at twenty, and in eleven years had seven children. Her first child was born prematurely, and she had never been well since, for she got up and undertook a railway journey on the fourteenth day. After this she had continuous hemorrhage for several months. She had several premature and dead children after this, and then one living child and the seventh dead. Three years previous to my seeing her, she consulted a distinguished metropolitan specialist, who, upon his consulting-room couch, "did something to her which gave her immediately a violent pain in the back," and that pain she never lost for an hour, save when asleep or narcotized, till the day I operated upon her. What this was, which was done to her, of course I do not know, though I have little doubt it was the rectification of her remarkable retroversion by the sound. If it was, it is another example which we may quote against this mischievous practice. When I first saw her, I got the story that ever since this incident, the patient's life was a misery to her and her surroundings —that she could not get about—was on the couch all day long—her menstruation so protracted and profuse that it lasted quite half the month—and she had hardly recovered from the exhaustion consequent upon the loss and the increase of her suffering, when she was ill again. She had been under the hands of quite a number of specialists, both here and in London; and after reading her case up, and comparing the opinions expressed about it, and having come across one of my cases of spaying, she came to me deliberately to ask me if I thought I could spay her, and, if I could, if I thought it would do her good. She had been told that the womb was bent backwards, but that there was a tumour on either side of it. The tumour in question I found to be enormously enlarged and very tender ovaries lying behind and below a retroflected and retroverted fundus, which felt so large that it really might have been a question whether or not there was a myoma in it. From my previous experience, I was of opinion that fundal enlargement was due merely to chronic fundal metritis, though I was quite prepared to find a myoma at the operation. I had no diffi-

culty in such a case as this in recommending the removal of the ovaries, for the mere names of the gentlemen under whose care she had previously been, without benefit, were sufficient guarantee that everything short of that had been tried. Moreover, the patient, a clever, intelligent woman, knew all about her case, and told me pretty accurately all that had been done. I had, besides, the advantage of the history given by one of her medical attendants. The immediate arrest of the hemorrhage, which had been uncontrolled even by hypodermic injection of ergotin, would alone have been a sufficient warrant for the ovariotomy, but there were numerous other reasons in its favour. I, therefore, performed it on April 9th, and found the fundus enlarged from chronic fundal metritis only, the ovaries enlarged from chronic interstitial inflammation, and the displacement as I have described it. I removed the ovaries and tubes, and then stitched the uterus up to the wound, as in Case XIII. She made an uninterrupted recovery. She had no sign of menstruation until a month ago (April 1st). Mr. Crompton saw her with me after that, and we found the uterus perfectly normal in position and quite small. As she has passed through the climacteric distress, I have no doubt that the return of menstruation will be only temporary, the more as it seemed to be completely under the control of ergot. She has gained flesh and colour, and but for a persistent pain in the back would be perfectly well.

CASE XVII.—This case was sent to me by Dr. Clarke, of Chasetown. She had had considerable loss at her periods for eight or nine years, these lasting always a week and often longer. She married in 1878, and has been very much worse since. In July, 1879, after riding some distance in a cart, she was attacked by violent pain in the abdomen and profuse hemorrhage, which continued, in spite of treatment, more or less for four months, and produced a condition of extreme anæmia. In November, the loss became intermittent, but remained very profuse, and resisted all treatment. I saw her early in 1880, and recognized a large uterine myoma. After-treatment by ergot continued till April without effect. I removed the ovaries in April, removing the tubes as well as the ovaries. She left the hospital on May 15th very much improved, and the report in November last was, "She is well and strong, quite a different woman. She has seen nothing since the operation, and the tumour is not half the size it was in April last." She still continues in good health, and there has been no appearance of menstruation.

CASE XVIII.—In this patient, who came to me from Dr. Imsull, of Solihull, menstruation had been scanty until a year before I saw her, since which time it has become so profuse as to have to all appearances almost drained her of blood. For two years a tumour had been known to exist, and this I recognized as a large myoma, reaching about two inches above the umbilicus. I admitted her to hospital, and with a great deal of hesitation opened the abdomen to remove the ovaries. I did not find them till I had made an incision nine inches long, and pulled the tumour, which was very nodular, completely outside. It had no pedicles, or I think I should have performed hysterotomy. Down in the pelvis behind the tumour I found the ovaries, which were cystic and very large, almost as large as a clenched fist. After removing the ovaries and tubes, I had very great difficulty in getting the tumour back into the abdominal cavity and the wound closed over it. She made a very rapid recovery, and has never lost a drop of blood since. She speedily gained flesh and colour, and about six months after the operation I exhibited her at a meeting of the

Birmingham Branch. The cicatrix of my nine inches was then only seven and a half inches long, and the tumour did not rise to its upper limit by nearly two inches, the size of the tumour being certainly less than half what it was at the time of the operation. She has suffered a good deal from climacteric distress, but when I saw her last (on April 21st) she was in very good health.

CASE XIX.—This patient, sent to me by Dr. C. H. Phillips, of Homley, had been married seventeen years, and had had only one child, two years after her marriage. After her confinement, she had had some pelvic illness, of which she gave no very clear account, but which I have no doubt was peri-oöphoritis. Her periods ever since have been too frequent and too profuse, indeed, she was seldom a fortnight clear. The pain at her periods was intense, and she was seldom free from pain. Her attendant, Dr. Phillips, of Homley, had sent her down several times to me, and I had tried a variety of methods of treatment without any benefit. The condition was that the uterus was retroverted, with a large tender mass on either side of it, which I supposed to be the ovary, but which the operation proved to be the distended Fallopian tube. I saw her first in Feb. 1880, and in July Dr. Phillips wrote: "She does not seem to me to be any better than she was before she came to Birmingham the first time. Since she last saw you, six weeks ago, she has been distracted with pain in her back, and also in the left iliac region, which I cannot relieve, even with strong doses of opium. She has also been unwell three times during the last six weeks, each time over six days, and is now only just recovering from what has been a severe attack of flooding." We, therefore, agreed to remove her ovaries, and this I did on August 3d. I found them large and cystic, strongly adherent to surrounding structures, so that I had to exercise great care in picking them out. The infundibulum of each tube was densely adherent to its ovary, and the tube was distended into a large cyst by yellow serous fluid. She made a very good recovery, and in a letter to me in September she wrote "I am very much better; I am thankful to say I have no pain like I had before the operation." For a long time before the operation she could not submit to marital intercourse at all. Now she can do so without any discomfort.

CASE XX.—In June, 1880, I was called by Dr. Collis, of Bridgnorth, to see with him, in consultation, a lady of very eminent social position, on account of persistent metrorrhagia. She was twenty-nine years of age. She had been married six years, and before that had suffered always more or less from a white discharge and irregular and profuse menstruation. Nine months after marriage she was confined of a still-born child, and nearly lost her life from hemorrhage. Two years after she had another child, living, and in the following year another child, both labours being characterized by unusual hemorrhage. In 1878 she had a miscarriage and was alarmingly ill from hemorrhage. In August, 1879, a third child was born about six weeks before the full time, when again the hemorrhage was extreme.

Dr. Collis favours me with the following notes of the progress of this most interesting case. He saw her first on May 31, 1880, when he was informed that up to a fortnight before his visit she had missed three menstrual periods, but that during the fortnight there had been a continuous flow. Neither she nor her husband thought it possible that she was pregnant. They regarded it as her usual profuse and protracted menstruation; but on examination Dr. Collis found the uterus enlarged. He

kept her in bed and gave her astringents, and afterwards ergot and bromide of potash. Finally he had to plug the vagina, and then he telegraphed for me to see her with him. I saw her on the evening of June 13th, and found the patient very anæmic, and the uterus enlarged as if by a pregnancy of the third month. The cervix being closed it was clear that we must dilate, and for that purpose I introduced my instruments, which act by continuous elastic pressure. In a few hours dilation had proceeded so far that, after placing the patient under ether, I was able to empty the uterus of a large quantity of clot and some villous cysts. These, I presume, were remains of a chorion of which the villi had undergone cystic dilatation, but nothing in the shape of membranous or placental structure could be discovered. Recognizing the urgent necessity of there being no more hemorrhage, I took great pains to remove everything from the uterus, and I scraped the whole of the inner surface over with a curette. She had no further loss and made a good recovery till the 10th of July, when her period came on very profusely, lasted ten days, and left her very anæmic and exhausted. During the whole time she took large doses of bromide of potash and ergot, but with no apparent effect. Hemorrhage again occurred on July the 29th, by which time she had been removed to Malvern, where she was under the care of Drs. Pike and Weir. The hemorrhage was extreme, and everything was tried, including hypodermic injections of ergotin, without any avail. I was sent for on August 3d, and found the patient in the very last stage of anæmic exhaustion. I removed a plug which had been placed in the vagina, found the uterus perfectly small and normal, explored it with the alligator forceps but found nothing in it, and I applied solid nitrate of silver freely to the inside. This stopped the hemorrhage for about twenty hours, but after that it came on and I was sent for again on the 6th. At my visit on the 3d I had informed the husband that if the nitrate of silver did not check the hemorrhage I knew nothing short of a surgical operation which would, but I said nothing to him as to the nature of the operation I intended to perform. When telegraphed for on the 6th, I replied that I should bring my assistant and everything prepared to operate if it was thought desirable, and for this purpose my friend, Dr. J. W. Taylor, accompanied me to Malvern, in the absence of Mr. Raffles Harmar.

When I reached the house I met the husband, a man of distinguished position and great intelligence, at the door. He greeted me with the remark that he did not know what I proposed to do, that he left it entirely to me; but that he was perfectly sure the only thing which would give either temporary or permanent relief would be removal of the ovaries. As this was exactly my own notion, and was readily agreed to by my colleagues in the case, I at once proceeded to carry it out, my only fear being that we had delayed it too long. She was blanched beyond my powers of language to describe, and she had those swollen, waxy lips which are rarely restored to their original condition. There was no difficulty in the operation, and both ovaries were found to be cystic and about the size of Mandarin oranges. The uterus was perfectly normal in size and consistence when I had it between my fingers. The incision was only two and a half inches long, and its bleeding points were indicated by a flow of serum almost devoid of colour. For about an hour after the operation, I gave up almost all hope of her recovery. Dr. Pike and I were in almost constant attendance upon her for five days, during which she had some ups and downs, but finally she got right. She has had the usual flushes and

other slight indications of the climacteric, but these are now completely worn off. In this case I did not remove the tubes, and on the 26th of March, 1881, they informed me that she had a slight period; this again occurred towards the end of April.

CASE XXI.—In this case, sent to me by Dr. Sutton, of Wednesbury, menstruation did not appear until she was nineteen. She was pretty well until marriage (at twenty-two), but she has never been well since. Menstruation speedily became irregular and very profuse, often lasting a fortnight, and she suffered intense pain during the whole time, the pain amounting to agony during the first three or four days, and large doses of opium were taken for its relief. She had never become pregnant, and married life was the source of such suffering that she had to decline it altogether. Dr. Sutton had treated her so well that it seemed to me useless to try over again all that he had found useless. I therefore advised removal of the ovaries, and this was performed on August 16, 1880. Both glands were adherent down in Douglas's pouch, and were removed with great difficulty. The tubes were adherent to the ovaries, and distended by about an ounce of purulent fluid. They were removed with the ovaries. She made a speedy recovery, and has not menstruated since. Dr. Sutton tells me she is in perfect health. I have not seen her since October, and then she told me that intercourse had been resumed satisfactorily.

CASE XXII.—This patient, placed under my care by Dr. Drummond, of Fosta Green, had been gradually getting large round the waist for eighteen months, and her periods during the same time had become excessive. A large myoma occupied the pelvis and lower abdomen, and had given rise repeatedly to retention of urine. I admitted her to hospital and removed both ovaries and tubes on August 17, 1880. She left the hospital well on September 5. I heard of her in January last as being perfectly well, but I have not seen her personally, and I have not been able to trace her since January.

CASE XXIII.—This patient had noticed for twelve months that her abdomen had been increasing in size, and her periods had become so excessive that her condition, when sent to me by Dr. Fenton, of Coventry, was one of advanced anæmia. She had a large myoma reaching almost to the umbilicus. I admitted her to hospital and removed both ovaries, which proved to be cystic. The tubes were not removed in this case, but the arrest of the hemorrhage, up to the time I last heard from her, was complete.

CASE XXIV.—This case was sent to me by Dr. Horton, of Chasetown, and was in some respects as remarkable as XX., though it is not necessary to occupy so much space with its detail. She was thirty-nine years of age, had been married at fourteen years of age, and was confined of her first child before she was sixteen, her second at seventeen, eight months after she had a miscarriage, and then for the next ten years had a baby every year. At each confinement the hemorrhage was very great, and two or three times she was supposed to be dying from this cause. As she had no menstruation for twelve years, being either always pregnant or suckling, she could tell nothing about this matter until she became a widow at twenty-eight. She married again about four years ago, and during her widowhood her menstruation had been far too frequent and too profuse, and she had been almost constantly in the doctor's hands on that account. Since her recent marriage she has had eight miscarriages in forty months, the first being at seven months, and the others between

four and five. She was admitted into the hospital in February last, when pregnant at the third month. She was put upon chlorate of potash and biniodide of mercury, in order to avoid the repetition of the miscarriage, and she took every precaution to assist us in this, for both she and her husband were very anxious for a living child. In spite of everything, however, she miscarried at the fifth month, and as nearly as possible died from the hemorrhage. During May, June, and July, she had most profuse menstruation, in spite of a great variety of treatment; and when admitted into hospital again, she was a completely broken down, anæmic woman, whose desire was to die if nothing more could be done for her. In this case it did not occur to me to remove the ovaries, and that proposal originated with my colleague, Dr. Hickinbotham, at the consultation held on the case. I am bound to say I did not regard the idea with favour at first, and it was only after prolonged discussion with my colleague, and finally at the earnest and frequently repeated request of the patient herself, that I undertook it. This request was based on her knowledge derived from a patient in the same ward, who was recovering from the operation. Here again the ovaries were cystic, and the patient made a complete and rapid recovery. In this case I also removed both tubes. Though only a few months have passed since the operation, the woman's improvement is most manifest. I saw her lately and hardly recognized her. She has not had the appearance of menstruation since the operation.

CASE XXV.—This case was brought to me by Dr. Somerville, of Bloxwich, in a condition of advanced anæmia. She had been married thirteen years, but had never been pregnant. Her periods came on after only ten or twelve days' interval, and were extremely profuse. Dr. Somerville had tried everything in vain, and I therefore advised removal of the ovaries, though I had some doubt as to whether the case was not too far advanced for the operation to be successful. I removed the ovaries on October 26, 1880, and found them both cystic. The tubes were also removed. She made a very protracted and anxious recovery, suffering from excessive night sweats and high temperature for six weeks, so that I feared she was likely to become tubercular. She went home on November 29th, and recovered slowly under Dr. Somerville's care. He informs me that there has been no return of the hemorrhage, and that his patient is doing well.

CASE XXVI.—This case was placed under my care in November last, by Dr. Stephenson, of Bradninch. She was forty-two years of age, and for three years had suffered from pain and profuse menstruation. Two years before she noticed an increase in her size, and some months after that Dr. Stephenson recognized the presence of a tumour. The periods came on at intervals of only eight or ten days, and the loss was excessive, resisting all remedies. On Nov. 16, 1880, I opened the abdomen, and finding it impossible to remove the tumour I removed the ovaries. They were both cystic. She had no bad symptom till the fourth day, when the abdomen began to distend. Every effort to get the bowels to move was fruitless, the distension increased so as to threaten to tear open the wound, and I had to resort to puncture of the intestines to avoid this catastrophe. The temperature did not rise at all, and the pulse only when exhaustion set in. She died on the eighth day, and the post mortem revealed nothing but simple distension of the intestines, with a limited effusion of lymph in the neighbourhood of the wound, which was sloughy and gaping.

CASE XXVII.—This patient was placed under my care by Dr. J. W. Taylor, of Birmingham. She had a myoma as large as a child's head,

the symptoms of which had been present and progressing for three years. For nine months she had been under Dr. Taylor's care, and his treatment for its arrest had not been successful. He therefore placed her under my care for the purpose of removing the ovaries, which I did on December 18, 1880. They were very difficult to find, and were both cystic. I removed the tubes as well. She recovered rapidly. I have not seen her since, but Dr. Taylor tells me her progress is perfectly satisfactory, and there has been no more hemorrhage.

CASE XXVIII.—In this patient, sent to me by Dr. Plowman, of Coventry, there was a pelvic tumour, the nature of which was not clear. The symptoms were urgent, and the patient very anæmic. I removed the ovaries on Jan. 13, 1881, and found them both cystic. I removed the tubes as well. She left the hospital on February 1st. A few days after leaving the hospital she became very ill, and in about a week I went over to Coventry to see her, and found that something had sloughed out of the uterus, probably a piece of the tumour. Even at the operation the nature of the growth was not clearly ascertained, though it seemed to be myoma of the anterior wall. She has made a good recovery, and menstruation so far is completely arrested.

CASE XXIX.—This woman, recommended to me by Dr. Kenny, of Birmingham, had been married nineteen years, and had three children, the youngest being seven years of age. About eight years ago, her periods began to be profuse, and they have continued progressively so ever since. Marital intercourse or any excitement always brought on a flooding. She had wandered about from doctor to doctor, and had been in several hospitals without deriving any benefit. Dr. Kenny placed her under my care for the purpose of having the ovaries removed, on account of a large myoma which he had discovered. Amongst other treatment employed was that of Chian turpentine at the hands of its introducer, for a period of seven months, and without benefit. She was so feeble and so extremely anæmic, that I greatly feared I should have an unfortunate result. The operation was performed on Feb. 11, 1881. The tumour was as large as a cocoa-nut. The right ovary was a cystoma, almost as large, and the left ovary was also cystic, as large as a clenched fist. Both tubes were removed. The patient made an excellent recovery, and has lost no blood since.

CASE XXX.—This patient is just completing her recovery from the operation, and, therefore, nothing can be said more than that the tumour was very large, the ovaries were very difficult to find, and were both cystic, and that the tubes were both removed. She is a near relative of her medical attendant, Dr. Sutton, of Durlaston, who has been associated with me through the case. Though it is only about six weeks since the operation, the tumour is much less than it was before, and one of the most distressing symptoms, retention of urine, is completely relieved.

CASE XXXI.—A. W., 25, sent to me by Dr. Forty, of Wotten-under-Edge, with the following letter: "Do you remember a young woman named ——, who was under your care at the Birmingham Hospital for Women in June, 1879? She suffered then from painful and profuse menstruation. She is now in much the same condition as when she was under your care. The periods are frequent and very painful; the loss of blood excessive, and between each period there is a great deal of white discharge. She gets attacks of abdominal distension, and suffers a good deal of pain constantly. She can hardly move about the house even. After reading

your account of cases of ovariotomy it struck me that this girl might be a case in which such an operation would be justifiable and successful. She is perfectly willing to undergo this or any other measure which would be likely to give her relief. She has been in the hands of several competent medical men, and all sorts of simpler means have been tried."

In the hospital notes I find that in 1874 I had dilated and explored this girl's uterus, and found nothing in it, that I had repeatedly rubbed the whole mucous surface with solid nitrate of silver and with nitric acid, and with no result. When she came back to me in February last, I found her very anæmic, quite unable to walk, and both ovaries large, tender, and fixed. I removed them with the tubes on March 2d, and found them both cystic, the left being adherent between the uterus and rectum, and as large as an orange. She made an easy recovery, and went home in the second week of May, much stronger, and almost free from pain, and able to walk fairly well.

No.	Age.	M. or S.	Disease.	Operation.	Date.	Hosp.	Private.	R.	D.	After result.	Remarks.
1	41	S.	Cystoma	Rem. left ov.	April 22, '73	..	P.	R.	..	Complete cure	
2	40	M.	Myoma	" both "	May 22, '73	..	P.	R.	..	" "	
3	41	M.	Cystoma	" right "	Sept. 9, '73	..	P.	R.	..	" "	
4	44	M.	Myoma	" both "	Dec. 23, '73	..	P.	..	D.		
5	38	M.	Myoma	" " "	Mar. 14, '74	H.	..	..	D.		
6	21	S.	Cystoma and perioöphoritis	" " "	Aug. 8, '79	H.	..	R.	..	Complete cure	
7*	41	S.	Myoma	" " "	Aug. 28, '79	..	P.	..	D.		
8*	47	M.	Myoma	" " "	Oct. 18, '79	..	P	R.	..	Complete cure	Ovaries cystic.
9	52	M.	Myoma	" " "	Nov. 30, '79	..	P.	R.	..	" "	
10*	34	M.	Myoma	" " "	Jan. 13, '80	H.	..	R.	..	" "	" "
11*	48	S.	Myoma?	" " "	Jan. 17, '80	H.	..	R.	..	Died of cancer	" "
12	22	M.	Ovaritis	" " "	Feb. 9, '80	..	P.	R.	..	Complete cure	" "
13	36	S.	Ovaritis	" " "	Feb. 26, '80	..	P.	R.	..	" "	
14	52	S.	Myoma	" " "	Mar. 10, '80	..	P.	R.	..	" "	
15	42	S.	Myoma	" " "	April 7 '80	..	P.	R.	..	" "	" "
16	33	M.	Ovaritis	" " "	April 9, '80	..	P.	R.	..	Great improvement	
17*	39	M.	Myoma	" " "	April 22, '80	H.	..	R.	..	Complete cure	" "
18*	46	S.	Myoma	" " "	May 8, '80	H.	..	R.	..	" "	" "
19	37	M.	Cysts of Fal. tubes	" " "	Aug. 3, '80	..	P.	R.	..	Great improvement	Ovaries cystic and tubes adherent.
20*	29	M.	Cystoma	" " "	Aug. 6, '80	..	P.	R.	..	Complete cure	Ovaries cystic.
21*	28	M.	Cirrhosis of ov.	" " "	Aug. 10, '80	H.	..	R.	..	" "	Tubes adher'nt
22*	49	M.	Myoma	" " "	Aug. 17, '80	H.	..	R.	..	Great improvement	Cystic ovaries.
23	47	M.	Myoma	" " "	Sept. 1, '80	H.	..	R.	..	Compl'te arrest	Ovaries cystic.
24	39	M	Cystoma	" " "	Sept. 10, '80	H.	..	R.	..	" "	
25	35	M.	Myoma	" " "	Oct. 26, '80	..	P.	R.	..	" "	" "
26*	42	M.	Myoma	" " "	Nov. 16, '80	H.	..	R.	D.		
27*	44	S.	Myoma	" " "	Dec. 18, '80	H.	..	R.	..	" "	" "
28*	32	M.	Myoma	" " "	Jan. 13, '81	H.	..	R.	..	" "	
29*	43	M.	Myoma	" " "	Feb. 12, '81	H.	..	R.	..	" "	" "
30	34	S.	Myoma	" " "	April 20, '81	..	P.	R.			
31	25	S.	Cystoma	" " "	Mar. 2, '81	..	P.	R.	..	.....	" "

The thirteen cases marked (*) had the spray and other Listerean details used, and as they include one of the two deaths in the recent series (25 in number), it is clear that they have had no influence one way or the other in the results.

From these cases I think the following conclusions may legitimately be drawn:—

I. That as far as its primary results are concerned, removal of the uterine appendages for the arrest of intractable uterine hemorrhage, is an

operation which is quite as easily justified as any of the major operations of surgery.

II. That so far as its secondary results are yet known, it is an operation which yields abundant encouragement for its further trial.

As conclusions which are indicated, but not wholly proved, I think I may formulate a statement that removal of the ovaries alone is not sufficient to arrest menstruation, but that removal of both tubes and ovaries does at once arrest it. So far as some of these cases have gone the arrest would seem to be permanent. This conclusion is quite in harmony with what is known of removal of both ovaries for large cystomata, for in such cases the tubes are almost uniformly included in the clamp or ligature, and menstruation is arrested.

Three at least of the cases, and probably two others, show that the arrest of menstruation by this means leads, or may lead, to the atrophy of the tumours.

Finally, there is some close connection, here pointed out I believe for the first time, and worthy of very clear study, between uterine myoma and its accompanying hemorrhages, and cystic disease of the ovaries. In two of the cases the cystic disease seemed to be the cause of the hemorrhage, without any myoma intervening.

Another conclusion is, I think, to be justified, that the whole subject is worthy of careful study, and should not be made the subject of premature and hostile conclusions.

ARTICLE III.

AN EXPERIMENTAL STUDY ON THE ACTION OF SALICYLIC ACID UPON BLOOD-CELLS AND UPON AMŒBOID MOVEMENTS AND EMIGRATION.

By T. MITCHELL PRUDDEN, M.D., Director of the Physiological and Pathological Laboratory of the Alumni Association of the College of Physicians and Surgeons, N. Y.; Lecturer on Normal Histology in Yale College; Pathologist to the Manhattan Eye and Ear Hospital.

IT was shown by the writer in a recent number of this JOURNAL, January 1881 (p. 82), that dilute carbolic acid possesses an inhibitory power over the amœboid movements and the capacity for emigration of the white blood-cells: and it was suggested as extremely probable, therefore, that a part of the favourable action of carbolic acid in the healing of wounds, at least in so far as the prevention of undue suppuration is concerned, is owing to the reduced activity of the white blood-cells. In view of this suggestive probability, for absolute proof is scarcely to be expected with our present facilities for investigation, it is evidently important to know whether the effects of other agents which exert a like favourable influence upon the healing process, can be partially or entirely accounted for

on the same grounds. As one of the most important competitors for favour in antiseptic surgery salicylic acid is the first to suggest itself, and the purpose of the present article is to record a series of experiments with this agent similar to those just referred to with carbolic acid.

The methods used were essentially the same as those described in detail in the above-mentioned paper, and it will be necessary only to refer to them here, detaining the reader with little else than a brief account of the results. The experiments were largely made upon spring frogs of the species Rana clamitans,[1] but control experiments were made upon the blood of the rabbit and of man. The salicylic acid was dissolved in a half per cent. solution of sodium chloride, for the purpose of eliminating from the experiments, as much as might be, the action of water, by giving to the solutions a proper degree of concentration. It was used in solutions of the strength of 1–300; 1–500; 1–1000; 1–3000; 1–4000; 1–5000.

The first series of experiments upon frog's blood was made by irrigating, on a slide, the blood or mixed blood and lymph drawn from the toe.

Strong Solutions in Frog's Blood.—The effect of solutions of 1–500 and stronger, on both red and white blood-cells, is to cause rapid death of the cells and profound changes in the protoplasm. If such solutions are added to specimens in which the leucocytes are in active motion, as soon as it fairly comes in contact with them, all movement ceases at once, the cell processes are usually somewhat contracted and the cell body becomes more coarsely granular. The nucleus very soon becomes visible, then shrinks considerably, and presently the cell bodies appear to be broken up into larger and smaller irregular particles of strongly refractive material lying in a transparent matrix: the nuclei also undergo the same degeneration. After this no change occurs in the cells while they remain in the acid. Almost at the same instant that alterations are seen in the leucocytes changes commence in the red blood-cells. The first change observed is the rapidly increasing distinctness in the outline of the nucleus and of the intra-nuclear network, and sometimes hand in hand with this appears a slight irregularity in the contour of the cell. The observer must now be on the alert, for, sometimes almost faster than he can follow them, very marked changes occur in the cell body. At first an almost indefinable darkening of the body occurs, as if it were being suddenly shaded from the light below, this very rapidly deepens and merges into a mottling of the surface which usually, almost before it is defined, gives place to a distinct, shining, close-

[1] I wish to correct an error which I committed in the paper above referred to, in calling the species of frog experimented upon with carbolic acid Rana esculenta: it was R. clamitans; the European species, R. esculenta, as I have been subsequently informed, not occurring in this country. This is a matter of no little importance, because, as is well known, there are considerable anatomical differences between different species of frogs, and also, as I have frequently observed, physiological peculiarities, in their power of resisting deleterious agencies, and in their reaction towards drugs, so marked as to make their recognition imperative in experimental studies.

meshed, reddish-yellow network stretching from the nucleus to the periphery of the cell. A homogeneous, much less refractive substance lies in the meshes of the net. A similar, but coarser network is now seen in the shrunken nucleus. Sometimes this condition of the cells persists for a few seconds or minutes, or even hours or days, but more frequently, in the majority of cells, the observer is startled to see the entire body suddenly and symmetrically enlarge; the meshes of the new-formed network within the body spread out, the fibres becoming more slender, and often breaking away from the sides of the cell, and the whole becomes decolorized. The nucleus meanwhile may remain unchanged, looking however more distinct by contrast, or it may become shrunken, nearly homogeneous, and very strongly refractive. Sometimes upon the sudden enlargement of the cell the network in the body becomes so delicate as to be almost invisible, and it may altogether disappear.

The cells after this enlargement are still flattened ovoids, and about one-fifth larger than before. In some cases the change occurs so rapidly that the intermediate changes in the process are lost sight of or do not occur, and the enlarged cells, with their sharply defined nuclei and almost (sometimes quite) transparent colourless body, bounded by a delicate contour line, appear where but an instant before the eye of the observer was fixed upon a slightly mottled cell. Numerous slight departures from the above description may be observed, depending upon the directness with which the acid comes in contact with the cells, etc., but it is not necessary to describe them in detail here.

The network in the cell body, when its development is evident, may be readily stained with eosin and other colouring agents. It would seem most probable that its development is the result of the rapid disintegration of the protoplasm of the cell, perhaps a residuum of the stroma after the decomposition, or separation and discharge of the hæmoglobin, and not that it is a pre-formed structure analogous to the intracellular networks so freely described by certain authors. Somewhat similar appearances are produced in the cell by carbolic acid and other agents.

Strong Solutions on Mammalian Blood.—The action of salicylic acid, 1–500, upon the white blood-cells of the rabbit and of man is similar to that on the leucocytes of the frog, but the changes in the red cells are not as prominent as in those of the frog. There is at first the same mottling the cell and the formation of coarse, irregular, strongly refractive linear structures in or upon the cell, and then in almost all cases comes a sudden expansion and decoloration, and there is finally left a pale delicate spheroidal body which remains for a long time unchanged in the acid. Much less frequently at the instant that the agent touches the red cells, they enlarge and become globular, and the entire central portion is broken up into larger and smaller, often angular, strongly refractive particles which seem to float in a fluid within the unbroken contour of the cell. These little

bodies immediately commence to dance to and fro within the cell, and at the same time to grow smaller; they rapidly decrease in size, dancing faster and faster as they do so until they entirely disappear, leaving a pale spheroidal body similar to the red cells after the action of water. Sometimes, before the particles within have disappeared, they are suddenly shot out of one side of the cell in a brush-like cluster, and immediately disappear in the surrounding fluid. The movements in the new formed particles resemble the Brownonian movements.

Dilute Solutions on Frog's Blood.—With solutions of the strength of 1–1000 to 1–4000, death of both kinds of cells occurs sooner or later, but without as marked, though similar, morphological changes in the protoplasm, as those produced by stronger solutions. In solutions of 1–4000 amœboid movements in the leucocytes may continue on the slide, with suitable precautions against concentration of the irrigating fluid, for several hours, but they are very slow from the first, and when they have once ceased cannot be reinstated by washing out with the indifferent salt solution, but the cells on the contrary rapidly disintegrate. The red blood-cells are affected by these dilute solutions apparently in the same way as by other dilute acids,[1] as acetic and hydrochloric, becoming at first slightly granular and then, often with a sudden jerk, swelling out and becoming decolorized, with shrinkage of the nucleus, and sometimes with the development of an irregular delicate fragmentary network within the cell-body.

Dilute Solutions on Mammalian Blood.—Solutions of 1–1000 to 1–4000 cause immediate cessation of amœboid movement in the leucocytes of man and the rabbit, when studied on the warm stage, and the nucleus soon becomes visible and the cell-body shrunken and coarsely granular. On the red blood-cells the effect is similar to that caused by other dilute acids; they rapidly swell, assuming a globular shape and become decolorized.

Action on the Circulation and Emigration.—This was studied in the bladder and mesentery of the living curarized frog; Thoma's frog-plate being used as in the former experiments.[2] The effects of solutions of varying strengths may be briefly summarized. Solutions of 1–500, and stronger, cause cloudiness of the tissue and a granular precipitate in the blood-serum; then permanent stasis occurs in all but the larger trunks, and usually in these too after a few moments. The arteries and veins may contract slightly at first, but they then dilate largely (especially the veins) as stasis occurs, and very soon the blood-cells within undergo the same changes as when they are treated with the acid on the slide.

With more dilute solutions, 1–1000 to 1–3000, stasis comes on less promptly, but very surely within a few minutes or hours, and is accom-

[1] Kneuttinger, Zur Histologie des Blutes, Würzburg, 1865, p. 28. Stirling, Textbook of Practical Histology, 1881, p. 2.

[2] l. c., p. 86.

panied or followed by the same morphological changes in the blood-cells as are produced outside of the vessels. With still more dilute solutions, 1–4000, the circulation may continue in vigorous animals for many hours, twenty-four to thirty-six and over,[1] with but slight cloudiness of the tissues, and no evident changes in the bloodvessels beyond the usual inflammatory dilatation; *but emigration either does not occur at all or only to a very slight extent.* The parietal fixture of the leucocytes, which occurs under simple salt solution, is but slightly marked or almost entirely absent from the first, the cells rolling along as usual in the peripheral zone, but remaining spheroidal, and exhibiting little tendency to stick and drag along the walls. If the part is at first irrigated with salt solution until emigration is well established and this is then replaced by the salicylic solution, emigration very soon ceases and the parietal fixture of the cells becomes less marked, while the cells which have already passed out and are free in the tissues soon cease their perigrinations. In no case was it found possible to cause a re-establishment of emigration after it had once been stopped by the acid; a difference between the action of salicylic and carbolic acid which would seem to be of considerable significance.

SUMMARY—*Frog.*—Salicylic acid in very dilute solutions, 1–4000, checks or entirely suppresses emigration of white blood-cells in the bladder and mesentery, without sensibly affecting the calibre of the bloodvessels or the general character of the circulation, or the structure of the blood-cells. It also retards amœboid movements both in the tissues and upon the slide. Somewhat stronger solutions, 1–1000, cause stasis in the bloodvessels, death of the white blood-cells, and swelling and decoloration of the red cells in a manner similar to other dilute acids. Solutions of 1–500 cause instantaneous stasis; death of the leucocytes with disintegration of the protoplasm; while in the red cells it produces immediate decomposition of the protoplasm with decoloration and a separation into morphologically distinct elements, which may remain permanent in the acid, or undergo subsequent changes.

Man and Rabbit.—Dilute solutions, 1–1000 to 1–4000, cause cessation of amœboid movement in the leucocytes, with death of the cell and disintegration of the protoplasm, and in the red cells swelling and decoloration. Strong solutions, 1–500, cause instantaneous death of both kinds of cells, with marked morphological degenerative changes.

Remarks.—It will be seen by a comparison of the above results with those obtained in the experiments on carbolic acid that the latter is less inimical, in solutions of the same percentage strength, to the life and functions of the blood-cells than is salicylic acid. For neither upon the slide nor in the bloodvessels or the tissues can the movement of the leucocytes

[1] It should be remembered that emigration often commences in the bladder within a very short time after exposure of the part, sometimes within an hour.

be re-established when they have been brought to rest by salicylic acid, and the morphological changes produced by it are much more prompt and marked. It does not of course follow from these experiments that the action of salicylic acid in restraining emigration is peculiar to it in virtue of any properties other than those which it possesses in common with such dilute acids as acetic and hydrochloric, for these also in dilute solution are capable of restraining emigration, although with the exhibition of somewhat different phenomena. It is sufficient for the purposes of this paper to have shown experimentally, *that salicylic acid does restrain emigration, and is inimical in strong solutions to the life, and in dilute solutions to the activity of the white blood-cells;* and to suggest, as was done in the case of carbolic acid, the probability that some of its favourable effects, when applied as a surgical dressing, are due to its direct action upon the living white blood-cells.

Literature.—Closely upon Kolbe's announcement, in 1874, of a new method by which salicylic acid could be prepared cheaply and in large quantities, followed a flood of literature which has continued with little abatement to the present time. But among the hosts of valuable papers little is found in regard to the direct action of this agent upon the blood-cells, or locally upon the circulation.

Cotton[1] studied the effects produced by it on blood in the mass, with the view of determining the differences in its action upon the blood of different mammals, for medico-legal purposes. He notes that with three per cent. solutions the red cells become globular, and that the hæmoglobin is decomposed with formation of hæmatin. He also states that one per cent. solutions cause the central portion of the leucocytes to become more transparent, and gives them a double contour, from which he infers that these cells are furnished with a double membrane.

Thiersch[2] states, without giving the details of his experiments, that as a result of its action the central portion of the red cells becomes transparent, while a sharply defined peripheral zone remains deep yellow; and further that this peripheral ring may separate from the central portion and break up, at regular intervals, into segments, which form little free chains in the fluid. Under the conditions of his experiments the writer did not notice such appearances.

Béchamp,[3] who studied the action of salicylic acid upon the lower vegetable organisms, yeast, etc., found that dilute solutions, while sometimes modifying their structure, did not necessarily kill them, but did suspend their functional activity. These experiments, so far as the writer has the

[1] Cotton, Action de l'acide salicylique sur le sang et en particulier sur les globules, Lyon, Méd. 50, p. 557, 1877.

[2] Thiersch, Volkmann's Klinische Vorträge, Nos. 84 and 85, p. 657.

[3] Béchamp, Observations sur les antiseptiques, Montpelier Med., Janv. p. 30, Fev. p. 134, 1876.

literature at command, are all that bear directly upon the theme of the present study. Of the numerous experiments upon its action on the lower organisms, those of Béchamp are mentioned in this connection only as showing an inhibitory action of salicylic acid upon the function of vegetable organisms apparently analogous to that above recorded upon animal cells.

ARTICLE IV.

THE SMALL PUSTULAR SCROFULODERM.[1] By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania.

FROM time to time I have met with instances of a rare and striking form of skin disease, to which I desire to call the attention of this Association. There are several reasons why the subject is worthy of investigation. In the first place, the disease is unquestionably rare. Up to the present time but three or four cases have come to my notice. Secondly, the process is characterized by marked and well-defined lesions, and tends to pursue an obstinate and chronic course. It, moreover, always terminates in scarring. Thirdly, the disease is liable to be mistaken for other processes, especially for the small pustular syphiloderm, which it very closely resembles. I have already described the general features of the disease briefly in the second edition of my "Treatise on Diseases of the Skin," page 454, under Scrofuloderma, where it seemed to me it might, for the present, be placed. The account I have given of it in my treatise is as follows:—

"Another variety of disease, of which I have never seen any account in literature, and which, I think, must be viewed as a manifestation of scrofulosis, consists in the formation of pin-head and small split-pea sized, disseminated, yellowish, flat pustules, with usually a raised violaceous areola. In general appearance the lesions resemble those of the small pustular syphiloderm. They crust over gradually in the course of from one to several weeks, with depressed, shrunken, hard or horny, yellowish or grayish, adherent crusts, which in time drop off, leaving marked, punched-out looking, indelible scars, resembling those of variola. The lesions are further characterized by a sluggish, chronic course, and may last weeks or months. They appear at irregular periods, new ones coming out as the older ones disappear, so that the patient is rarely free of them. The disease may continue for years. It may occur upon any region, but in the cases that I have encountered has shown a disposition to appear about the

[1] Read at the fifth annual meeting of the American Dermatological Association, Newport, R. I., Aug. 31, 1881.

face and on the extremities. Other symptoms of scrofulosis are generally present."

I shall now report several well-marked examples of the disease, all of which were under observation for a long period, enabling me to study not only the lesions but the course of the process. They may be regarded, I think, as typical cases.

CASE I. The first case of which I have full notes is that of Mary C——, aged nineteen, single, a milliner, who presented herself for treatment at the Dispensary of the Hospital of the University of Pennsylvania on January 1, 1877. She was stout for her age, but was pale and strumous in appearance, with light-blue eyes, reddish hair, and freckled face, neck, and arms. The submaxillary glands under left jaw were chronically engorged, producing considerable swelling. She stated that her general health had always been and was still good. The disease of the skin, for which she sought relief, had made its appearance suddenly, according to her history, four years before, in December, upon the hands. The character of the lesions was the same then as now. After the first crop of lesions had fully developed, single lesions appeared from time to time, and continued to show themselves throughout the winter. During the summer the disease vanished completely, but returned the next winter. It had in this way continued to appear each year in winter, and to disappear in summer, always showing the same features, but with each attack involving more of the general surface. At first it invaded the hands only; the second season the hands, forearms, and ears; the third winter the same regions, while during the following summer the eruption did not, as previously, disappear, but persisted, and moreover involved the face, legs, and feet. The submaxillary glands first became swollen about a year before coming under observation. The following observations were made at the first examination:—

The eruption may be described as consisting of numerous, disseminated, small, pin-head, and split-pea sized, rounded, firm, pinkish or violaceous papules, papulo-pustules and pustules, in all stages of evolution and involution, together with more or less marked, similarly sized, irregularly outlined, punched-out looking, superficial or deep, soft, pigmented or whitish scars. The lesions are numerous, but are not profuse, from fifteen to thirty existing on either hand. They are disseminated, and show no disposition to group or form any definite arrangement. The majority are of the size of a small split pea, and have a rounded form. As stated, there are papules and pustules and intermediate stages. The papules are the earliest manifestation, and consist of firm, rather diffused, deep-seated, raised infiltrations of a pale pinkish or violaceous colour. The papulo-pustules show a central point of suppuration, which evidently has its beginning and chief seat in the corium considerably below the epidermis. The fully developed pustules, of which lesions the eruption is mainly composed, consist of a pin-head or small split-pea sized central, circumscribed, irregularly-shaped, bright or dull yellowish or whitish opaque suppurative portion, sharply defined against the slightly raised, reddish, papular base. The base or areola is not circumscribed, but fades off rather abruptly into the sound skin. Older pustules show evidences of desiccation, the suppurative portion exhibiting grayish or darkish, raised, rough, hard pin-head sized points. Other, still older lesions, show this point in a shrunken, contracted, dried state, and on a level with the papule or even

depressed, and of a hard or even horny consistence. Numerous scars, small and large, pigmented or whitish, of markedly irregular or jagged outline, sharply-defined, for the most part flat and superficial, resembling the scars of varicella and variola, also exist, and constitute a conspicuous feature of the process.

The eruption is distributed chiefly over the hands, forearms, and knees. There are also a few lesions on the face, and on the limbs in other localities. On the forearms it is confined mainly to the extensor surfaces with the exception of a few lesions about the wrists and palms. There are also a number of lesions, in all stages of evolution, on the backs of the hands and fingers. On the face they are less numerous, and less active than elsewhere. In the popliteal spaces they are more papular, and in places two or three are confluent, forming small patches. The hands and fingers, as well as the ears, are bluish, and are somewhat swollen, showing imperfect circulation.

The lesion is essentially a pustule seated on a raised and markedly infiltrated base. It begins in the form of a circumscribed induration, feeling like a small split pea under the skin. It can usually be detected by the hand several days or a week before any change of colour of the skin is noticed. In the course of the next few days it becomes firmer, slightly elevated, and papular, and of a pinkish or violaceous colour, varying from one to three or four lines in diameter. At the end of a week or a fortnight a pustule usually forms in the centre of the papule. As the pustule slowly dries in the course of another week or longer, there remains a firm or hard crust, or occasionally a small epidermic mass, which sometimes adheres persistently for weeks, at other times is cast off or may be picked off as a core. It comes away usually entire, and having a somewhat inverted cone-shaped attachment, resembles a dried sebaceous plug. The cavity which remains is comparatively deep and crater-like in form, and usually contains at the bottom a small amount of yellowish pus. After the core is removed, whether naturally or forcibly, the lesions tend to recovery and cicatrization, and by the end of from three to six weeks, appear as somewhat purplish or bluish, slight, more or less depressed, indurations or spots, pitted in the centre, and often surrounded by a *collerette* of epidermis which projects over its edge and gives the papule the appearance of having been let into the skin. The process of cicatrization proceeds until the papule becomes more or less puckered and drawn towards the centre, sinking slowly to the level of the skin and below it, finally resulting in a whitish, smooth, slightly pitted, sunken, conspicuous scar, from a half line to several lines in diameter, having a punched-out appearance, with a sharply defined irregular border. According to the patient's statement, the average duration of a single lesion is from two to three months. There is nothing of an acutely inflammatory nature about the eruption; on the contrary, it possesses a cold, chronic look. There are no subjective symptoms, but when a lesion happens to be accidentally injured, considerable pain is sometimes experienced.

Several lesions in the papular and papulo-pustular stage were excised and subsequently examined by Dr. Morris Longstreth and myself. The epidermis was normal except over the central portion of some of the lesions where suppuration existed. There it was thinner than elsewhere. The corium was sparsely occupied with lymphoid cells, which stained well with carmine. They were in no way peculiar or characteristic. They were found irregularly disposed, single or in masses, throughout the struc-

ture. No particular stratum was especially invaded. Not uncommonly they were in the form of short strings following the course of connective tissue bundles. About the centre of the papulo-pustular lesions the collection was more abundant, and immediately beneath the epidermis formed a closely packed mass, as in the case of other similar papulo-pustular lesions. The sebaceous glands were not involved. The examination showed the process to be a decidedly chronic inflammatory one.

The condition I have described was noted at the time to be peculiar, and to be different from any case previously encountered. No positive diagnosis was made, but the lesions bore such a strong resemblance to the small pustular syphiloderm as to suggest this disease. The patient was placed upon iodide of potassium and afterwards upon cod-liver oil and iron. Later, small doses of mercury were given. During the following six months the patient remained under weekly observation, and the above treatment was persisted in, but with no benefit. The lesions pursued their course apparently uninfluenced by internal remedies. Lotions of corrosive sublimate were also employed, but without benefit.

With the close of the first year's observation and treatment no marked improvement was appreciable. Through the summer the patient was much better than during the previous winter, but with the autumn the process became again more active. At times it was noted that the lesions would assume a cold, indolent, somewhat tubercular aspect, with but slight suppuration; at other times they began as small pustules, but were always accompanied with an elevated, firm or hard, pinkish or violaceous base. Sometimes the base as well as the pustule was conical in form, flattening as the process proceeded in its course. On several occasions it was thought that recovery was taking place, there having been periods when no new lesions manifested themselves for six or eight weeks. The glandular swellings of the neck also varied, improving and becoming worse from time to time. On several occasions they opened and discharged slightly, leaving no doubt as to their nature. A year later, in the summer of 1879, a note records the fact that the patient was again entirely free of the eruption, and that the glandular involvement had decreased markedly. She has not been seen since, but from the previous behaviour of the process I think it extremely doubtful that this improvement was in any degree more permanent than the former similar experiences.

CASE II. The next case I shall present is that of a man, a shoemaker by occupation, forty-one years of age, in average general health. I am indebted to Dr. Van Harlingen for the following notes: He states that he had a brother who died of hip-disease at the age of nine. There is no positive history pointing to scrofula. The disease of the skin to be presently considered was preceded by an attack of acute urticaria. A month later the existing eruption manifested itself on the left wrist, in the form of a few red papules accompanied with itching, and which were mistaken for bug-bites. New ones continued to appear, a few at a time, until in all about a dozen existed over the arms and legs. The hands were not

invaded. Some of the lesions healed while others continued to appear; some aborted. Every one, however, that arrived at maturity, he states, was succeeded by a pitted scar. The eruption lasted about three months, disappearing in August, but reddish marks in the place of the pustules remained for some months later, and were exceedingly slow in vanishing. Nearly a year elapsed, he thinks, before the scars became whitish.

A second attack of the eruption began one year after the first attack, namely, in June, 1877. It was more marked than the first. He applied at the University Hospital Dispensary a few times for advice, and subsequently was lost sight of until June, 1878, a year later, when a third attack occurred. It was identical in character with the preceding attacks, but the lesions were more abundant, and also involved the backs of the feet. As before, it disappeared towards the first of September. A fourth attack occurred the next year, in June, 1879, but was not so severe as that of the previous year. The condition, noted at this time, was as follows:—

The lesions are papular, papulo-pustular, and pustular. They are chiefly confined to the forearms, on both extensor and flexor surfaces, and are especially marked about the wrists. There are five on the right forearm, two being typically developed, and about a dozen on the left forearm. They are also found abundantly on the legs, to the number of certainly fifty, and perhaps a hundred, together with many scars. They extend over the backs of the feet. The palms and soles are free, and have always been so. Scattered lesions are found, moreover, here and there over the thighs, buttocks, and abdomen. The other regions are free. The lesions are widely disseminated, and are, as a rule, discrete, very seldom coalescing.

When a lesion first manifests itself, it appears as a pale pinkish, slightly acuminated, firm, well-defined papule, the size of a large pin's-head. It increases in diameter, becomes flatter, and whitish in the centre, where a small suppurating cavity or pit forms. Later, the pustule becomes puckered, the centre sinks somewhat, and a small slough covered with a grayish, yellowish, or brownish crust forms. The base now becomes more indurated and deeper in colour, and somewhat pigmented. On lifting up this crust, which is often adherent, a soft pultaceous or firm mass comes away, leaving an irregularly rounded sharply-defined, punched-out looking, crater-like cavity, containing pus. This soon dries up, leaving an indurated dusky or violaceous red papular or tubercular lesion. Gradually this is absorbed, and finally there remains a sharply defined, ragged, irregularly shaped, whitish scar, deeper at the edges than in the centre. The size of the scar varies from a small pinhead to a split pea. It resembles the impression made on the skin by a watch-key, having a depressed border; the scars of variola are also suggested. About the scar the skin is pigmented of a salmon, dusky-yellowish or violaceous colour. This is very persistent, some of the lesions of last year still exhibiting it faintly.

Occasionally the lesions are painful if struck or injured in any way, and at times there is slight itching about the older ones. Sometimes they manifest a sense of heat. Locally, the disease was treated with an alcoholic lotion of corrosive sublimate, a half grain to two ounces, but with no favourable result.

A month after the above notes were recorded, a crop of large indurated pustules appeared upon the thighs, which ran the usual course, and very slowly disappeared, leaving pigmentary spots and scars. A year later, in

July, 1880, the disease was still mainly confined to the forearms, thighs, and legs. As before, a few lesions existed upon the buttocks and trunk. Upon the limbs the eruption manifestly preferred the extensor surfaces. The character of the lesions had in no way changed. The eruption this year began as usual about the first of May, showing itself first on the forearms, a few new lesions making their appearance every few days.

In this case, as in the first, a characteristic lesion was excised and examined with the microscope. The appearances noted were the same as in the first case, although the infiltrating cells were more abundant.

CASE III. A third case was that of a seamstress, nineteen years of age, with light reddish hair, a freckled complexion, and a manifestly scrofulous constitution. She was spare and frail, and looked pale and imperfectly nourished. Her mother died of galloping consumption, and her father of typhoid fever. She had nine brothers and sisters, all of whom died before reaching the age of puberty. Upon either side of the neck there was a chronic enlargement of the lymphatic glands, some of which had broken down, and had thus secondarily involved the skin. This condition was, without doubt, of a scrofulous nature. The following notes were recorded at the date of her admission to the University clinic:—

Recently an eruption has made its appearance rather suddenly. She went to bed about a week ago as well as usual, and awoke in the morning to find a number of small pale-reddish papules scattered over the backs of the hands, unaccompanied by sensations of either pain, burning, or itching. Some of the lesions remained *in statu quo*, while others became slightly elevated, and in a few days manifested signs of suppuration on their summits; some broke open spontaneously, she thinks, and discharged a minute quantity of pus and blood, which rapidly crusted. New lesions have appeared daily, until now, at the end of a week, the backs of both hands and the wrists are abundantly covered with pinhead and split-pea sized papules and pustules. There are none on the fingers, but a few are found on the forearms as far up as the elbows. They are most numerous on the left hand and wrist, where perhaps fifty exist; on the right hand the number does not exceed twelve. The character of the lesions may be best described by first explaining the mode in which they develop. They begin as pinhead or small split-pea sized papules of a light pinkish or pearly-white colour, pretty sharply defined, and raised above the surrounding skin with a faint areola. As the lesion grows it becomes flattened and somewhat umbilicated, and of a dull pinkish colour. Soon a minute drop of pus appears in the centre of the papule, which is deep-seated and covered with a firm roof, showing, as a rule, no disposition to rupture. At the end of three or four days the summit begins to dry and to grow darker and to form a small, hard, horny crust, which separates at the border, and in a few days comes away, sometimes with a minute drop of bloody pus. If examined at this period a distinct pit, the size of a small pinhead, is seen in the centre of the lesion, with the epidermis somewhat abraded and ragged around it, the dull pinkish or violaceous papule being now enlarged to the size of a split pea. The eruption, therefore, may be described as consisting of numerous, discrete, disseminated pinhead and split-pea sized dull pinkish and violaceous, slightly raised, well-defined, firm, deep-seated papules, papulo-pustules and pustules, in various stages of evolution.

A fortnight after the above notes were recorded, the older lesions had

undergone involution, and were paler and crusted on their summits, with small, raised, hard crusts which could be picked off, leaving a deep cavity or pit-like depression. New lesions continued to appear. A month later, it was noted that a few new characteristic lesions were still appearing in the original localities, but the eruption as a whole had much improved. In the way of treatment, locally, a lotion of alcohol and corrosive sublimate was used, while internally, linseed meal in tablespoonful doses was prescribed. The scrofulous glands of the neck were treated with iodoform.

Two months later, the eruption on the hands had almost completely disappeared, but marked pigmentary stains remained. At the end of a year all trace of the disease had vanished, except slight whitish, irregularly shaped, depressed scars, which mark the site of the former lesions; some are conspicuous, like the scars of variola, others are barely perceptible. The scrofulous glandular involvement had also greatly improved, probably under the use of the linseed meal, which agreed well with the patient, and such other general and local treatment as was directed from time to time.

I have thus presented the notes of three marked cases, which it seems to me are sufficient to give an idea of the general characters of this well-defined disease. They all exhibit very similar features. There can be no doubt that they exemplify one and the same process. As regards the lesions, they are identical, the description of those of one case applying equally to the others. The course of the disease too, in all three cases, was similar, and although in one case it proved more rapid than in the others, the disposition of the process in all was emphatically to chronicity.

If we analyze the histories and the general condition of health, we find that in two cases there were positive signs of constitutional scrofulosis, while in the other case, this condition could not be satisfactorily demonstrated. Of the nature of the disease, therefore, it is perhaps premature to express positive opinion, yet there seems to me to be good reasons for regarding the disease, certainly in two of the cases presented, as a cutaneous manifestation of scrofulosis.

The microscopic examination shows the process to be a chronic inflammation, having its seat in the corium, but exhibiting nothing characteristic, either in the cells themselves, their arrangement, or distribution.

Concerning the diagnosis, I may repeat what was briefly stated in the opening remarks, namely, the liability of confounding the disease with the small papular and pustular syphiloderm; I may add, as this manifestation is often seen towards the second year or later, when the lesions are apt to be few, and to pursue a sluggish course. In the first two cases, however, the course of the lesions impressed me as being much slower than in syphilis, and I may remark it was this feature that first diverted my attention from this disease. The violaceous tint is also a symptom which would strike the observer as being different from that noticed in syphilis. Still another striking feature of the disease is the peculiar scarring, which, from the fact of the process having its seat deep in the skin, is marked and severe considering the size of the primary lesion. It

is, moreover, different from the scarring of the syphiloderm, in being sharply defined, as though punched out, and irregular, and also jagged or stellate in outline, or in some instances puckered. The disease may also be confounded with acne, especially if it happen to appear on the face only, but the fact that the lesions are not seated in the sebaceous glands, together with the slow course of the process, will serve to distinguish it from this disease.

As far as my knowledge extends, the affection has never been described by authors. It has, doubtless, been confounded with the syphiloderm. There is certainly no reference to it in any of the various works on diseases of the skin with which we all are familiar. In the standard French treatises, where so much space is devoted to the consideration and classification of the scrofulodermata, I have looked in vain for a description which might include the process under discussion. The *scrofulide cornée ou acnéique* of Hardy resembles somewhat the disease, but is nevertheless different, beginning in the follicles. Nor am I acquainted with any reports of cases of rare forms of skin disease which possibly might refer to the process. The cases reported by the late Dr. Tilbury Fox, under the title of "disseminated follicular lupus" (simulating acne), (*Lancet*, July 13 and 20, 1878), bear some resemblance to the disease, but an examination of his article shows the processes to differ in several important particulars to which it is scarcely necessary here to refer. The case presented before the New York Dermatological Society by Dr. Sherwell, last year (*Archives of Dermatology*, July, 1880), which was made the subject of discussion, wherein different opinions as to its nature were expressed by the members of the society, also bears some likeness to the disease I have brought forward in this paper, but it was doubtless the same affection as that reported by Dr. Fox, above referred to. Dr. Sherwell regarded the case, to use his words, as a "true lupus degeneration beginning as an acne."

ARTICLE V.

ANEURISM OF RIGHT AND LEFT PULMONARY ARTERIES; PULMONARY INSUFFICIENCY; DILATATION OF THE RIGHT VENTRICLE.

By JOHN F. DUFFIELD, M.D., House Physician to the Presbyterian Hospital, New York City, Member of the New York Pathological Society.

CASE I. S. C., female, æt. 50, New York, widow, domestic. Admitted to the Presbyterian Hospital August 4, 1881; service of Dr. Alexander Hadden. Family history negative. Previous history: Patient says that about nine years ago she suffered from an attack of pneumonia. Previous to this she had enjoyed fair health. Ever since, she has suffered more or less from palpitation of the heart, with vertigo; has been subject to subacute rheumatic attacks for a period extending over four years;

now suffers, in addition, from dyspnœa and a slight cough. Menses began at eighteen years; always regular. Had three children; labours easy. Complains of great nervousness. No history of syphilis. Temperate habits.

On admission. Very anæmic; general condition poor; lips and finger tips blue; jugulars full, but no appreciable pulsation. Œdema, with prominent veins, in each leg; anorexia; tongue pale, flabby, and indented; bowels fairly regular; pulse weak and irregular, and strikes the finger suddenly and immediately collapses; plain thrill in all the superficial arteries.

Urine. Sp. gr. 1002; reaction, acid; colour, straw; no albumen or casts.

Physical examination. Pigeon-breasted; lungs emphysematous at apices; area of cardiac dulness increased; apex beat plainly perceptible in seventh interspace, to left of the nipple; some episternal pulsation; a diffused heaving thrill perceptible with each systolic contraction, over an area of several inches between the nipple and the sternum. Auscultation reveals a loud blowing murmur taking the place of the second sound of the heart, diffused over nearly all the præcordial space, most distinct midway between the left nipple and the sternum, and about one inch above, and transmitted towards the xiphoid cartilage. At times the character of the sound is almost that of a double murmur.

The diagnosis of aortic insufficiency was made by all who examined her. Search was made for signs of an aortic aneurism, but with negative results.

Treatment. Extra plain diet. Bandages to legs. Tr. ferri chlor. ♏xv, t. i. d.; tr. digital. ♏x, t. i. d.

August 9. General condition somewhat improved; better colour; heart much more regular; and murmur more intense.

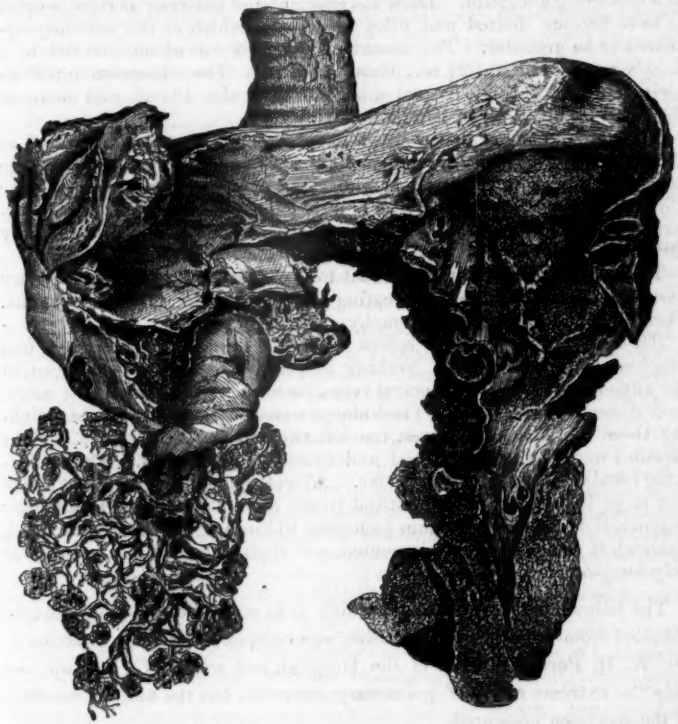
13*th.* Last night dyspnœa and palpitation extreme; dizzy, and much distressed; systole very strong and firm, the heart remaining contracted in systole every fourth or fifth beat, and intermitting one beat every time; murmur very loud. Ordered exclusive milk diet; substituted for digitalis, sol. morph. sulph. U. S. P. ℥j every four hours.

14*th.* Heart's action fairly regular, but weak; vertigo; patient flighty; breathing hurried and shallow; mucous membranes not so blue as yesterday; feet cold; œdema of legs undiminished. Ordered hot bottles. Chest freely cupped. Ammon. carb. gr. v. p. r. n. Stopped *pro tem.* all other medicinal treatment.

15*th*, 6.30 A. M. Patient found in a moribund condition; venous congestion extreme; œdema of lungs; Cheyne-Stokes respiration; pulse very weak, irregular, and intermittent; failed to respond to the usual treatment, and at 10.30 A. M. she died.

Necropsy twenty-four hours after death. *Rigor mortis* well marked. *Thoracic cavity.* The pericardial sac contained four ounces of bloody serum. The heart was considerably enlarged, and displaced toward the left. The enlargement, however, was confined entirely to the right side of the heart, the left being diminished if anything. There was one small milk patch on the anterior surface of the right ventricle. The weight of the organ was seventeen ounces. The valves of the left side were perfectly free and sufficient. There was, however, slight evidence of commencing fatty degeneration of the mitral valve. The aortic valves and the aorta were normal. The muscular substance of the left side was free from fatty

degeneration. The right ventricle was greatly dilated and the walls somewhat hypertrophied. The tricuspid valve showed advanced fatty degeneration and commencing atheroma. Its margins were thickened and widely separated, allowing a free regurgitation. The pulmonary orifice was



Aneurism of Right and Left Pulmonary Arteries. Anterior Aspect.—In removing the heart and cutting off the root of the great vessels, the anterior wall of the right and left branches of the pulmonary artery, as they sprang from the parent trunk, was removed, leaving only the posterior wall uniting the same. This portion of the artery will be seen directly in front and inferior to the perpendicular portion of the trachea which remains attached. The arteries have been opened along the anterior wall. The points of interest in the right aneurism are from above down: first, the dissection of the coats as noted in the necropsy; the cavity of the sac itself filled with the ordinary fibrinous clot; below, a portion of the pericardium folded over the aneurism; still lower, the ramifications of the dilated terminal branches of the pulmonary artery dissected out of the lung substance. Minus the dissection in the coats, the left aneurism is essentially the same, but below, some of the lung tissue was left intact, as one of the dilated vessels was split open and traced from the sac to the surface. Owing to the abundant fibrinous deposit in each aneurismal dilatation, the actual capacity of the sacs is not well shown in the drawing.

dilated, and the segments of the valve elongated and thinned. The pulmonary valve was found sufficient by the ordinary water test, but probably would not have been so, under considerable pressure, owing to the extreme thinness and great length of the segments. The pulmonary artery and its right and left branch were widely dilated throughout. Both the

pulmonary valve and the artery showed marked evidence of advanced atheromatous degeneration.

The right pulmonary artery was the site of a large aneurism, which apparently commenced at the junction of the superior and anterior portion, as a dissecting aneurism. Later the superior and posterior portion seemed to have become dilated and filled with fibrin, which at the necropsy appeared to be granular. The aneurismal tumour was about the size of a duck's egg. Length, 2¾ in.; diameter, 2 in. The numerous branches springing from this aneurismal dilatation were also dilated, and many of the small branches seemed to be dilated.

The left pulmonary artery was also the seat of an aneurism located at about the same point as the one just described and approximately of the same size. The left, as well as the right one, was filled with granular fibrin; but there was no evidence of any dissection of the coats. The arteries springing from the left aneurism were also dilated, even to the very surface of the lung.

The lungs were slightly adherent to the chest wall. The pulmonary tissue was perfectly normal, excepting a deep congestion and some œdema. There was a slight amount of emphysema at the apices.

Abdominal cavity. The spleen was soft, dark blue in colour, and weighed only four ounces. Nothing especially abnormal was noticed in the alimentary canal. The portal veins, its branches and their tributaries, were distended with blood. The kidneys were very small, the right weighing three and one-half ounces, the left two and one-half ounces. Their capsules were slightly thickened and extensively adherent. The underlying renal tissue was finely granular. *Microscopical examination.* There was large increase in the interstitial tissue, and there was slight granular degeneration of the epithelium (sclerotic kidney). The liver was small, although it was congested, pigmented, and slightly fatty. Its weight was only forty-one ounces.

The following record of cases, which is as complete a one as could be obtained from the accessible libraries, was compiled under the direction o Dr. W. H. Porter, Curator of the Hospital, and will serve to show, not only the extreme rarity of pulmonary aneurism, but the unique character of the specimen presented.

CASE II. Ambrose Paré ("Observations on Aneurism," by John E. Erichsen, London, 1844) mentions the case of a tailor named Belanger, who had an aneurism of the pulmonary artery, of which he died suddenly in consequence of the vessel bursting while he was playing at ball. Paré found a large quantity of blood effused within the thorax, the body of the artery dilated to the size of a fist, and its lining membrane quite ossified.

CASE III. Lancisus ("De Motu Cordis et Aneurismatibus," Lugduni Bat. 1749, also quoted by Erichsen) mentions the case of a hatter who, "in consequence of too great exertions, especially of an afternoon, in beating the felt f which hats are made, and inhaling at the same time coal-smoke mixed with a watery vapour, became affected with a dilatation of the pulmonary artery."

Crisp says: "Dilatation of this artery (*i. e.*, pulmonary), although not often described, is probably far from infrequent."

CASE IV. Hope relates an example where the artery was dilated to four and a half inches in circumference, and in "Case 84, Table of Arteries," the circumference of the vessel had increased to the same extent.

CASE V. In the Museum of St. Bartholomew's Hospital (No. 90) there is a

specimen of aneurism, with deposit of fibrin, in the left branch of the pulmonary artery.

CASE VI. Mr. Adam, in the 2d volume of the *Calcutta Medical Society's Transactions*, mentions a case of sudden death from the spontaneous rupture of this artery. The vessel was also considerably dilated, probably aneurismal.

Crisp says furthermore (*Prize Essay: Diseases of Bloodvessels*, London, 1847, page 91): "Two cases (Nos. 117, 359) of aneurism of the branches of the pulmonary artery will be found in the "Table of Aneurisms. I know of no case of aneurism of that artery before its division." The following are the cases alluded to by Crisp:—

CASE VII. Male, æt. 29; authority, *Edinburgh Monthly Journal of Medical Science*, vol. iii.; cause of death, hæmoptysis; attendant, Dr. Peacock.

CASE VIII. Male, æt. 41; authority, *Lancet*, 1841; cause of death, hæmoptysis; attendant, Mr. Foster.

According to Crisp's table, out of 551 cases of spontaneous aneurism reported in Great Britain from 1785 to 1847, two were of the pulmonary artery.

CASE IX. Dr. Dlauhy (*Viertelj. für Prakt. Heilk.* 1848) mentions a case of pulmonary aneurism. The vessel was in a state of well-marked atheromatous degeneration. On the posterior aspect was a sacciform aneurism of the size of quite a large walnut. The cavity extended particularly toward the right, the walls lying upon the left auricle, and producing a shallow indentation upon the latter. The parietes were composed of the degenerated atheromatous arterial tunics held together by the serous covering of the pericardium. Its cavity communicated with the lumen of the vessel by means of an oval opening, an inch in diameter, and, as is usual in cases of aneurism, was filled with fibrinous clots. On the posterior wall of the artery, running in the direction of the circumference of the artery, and extending through the pericardial covering, was a rent, measuring 1″3‴ (Viennese) in length. Its edges were ragged, uneven, and everted towards the cavity of the pericardium. Towards the right, the pericardium between the great and the adjacent aorta had been torn away and pierced in a cribriform manner.

CASE X. Prof. Gilewski's case (*Weiner Med. Woch.*, Nos. 33–38, 1868). Autopsy showed a sacciform dilatation of the pulmonary artery, the circumference of the vessel being equal to that of a pomegranate. The anterior wall united with the pericardium, the latter and posterior walls in relation with the adjacent vessels were connected respectively with the aorta and the left auricle by means of short-fibred connective tissue. The axis of the sac corresponded with that of the artery. The sac itself contained considerable blood and fibrinous clots. The walls consisted of all the tunics of the artery, the anterior, in addition, being covered by the parietal layer of the pericardium. The inner tunic was very much thickened and degenerated. The sac involved the *trunk* of the artery, and its two short branches arose immediately from the sac. The cardiac opening of the pulmonary artery was very much increased in size, the semilunar valves correspondingly enlarged, smooth, and translucent. One of the valves near its free border presented an opening the size of a pin's head.

CASE XI. Dr. Dowce exhibited (*Lancet*, 1874, vol. ii.) a case of aneurism of the pulmonary artery which occurred in a young woman aged nineteen. At the autopsy, recent lymph covered the outer surface of the pericardium and adjacent pleura, while recent lymph and a small quantity of blood occurred in the cavity. *At the root* of the pulmonary artery was a globular tumour, the size of a pullet's egg. A rent occurred in the outer wall of the aneurism, of which the sac was filled by a firm clot. There were vegetations on the pulmonary valves, and the right ventricle was dilated, the tricuspid valve being incomplete.

CASE XII. Skoda's case (*Abhandlung über Perk. und Auskult. Wien.* 1844, p. 311). Autopsy showed the trunk of the pulmonary artery to be dilated to a

sac of the size of a goose's egg. The ventricular opening was somewhat enlarged, the valves normal and sufficient. The lumen of the two primary branches of the vessel, at their point of origin from the sac, was reduced to the size of a crow's quill. The right branch was somewhat hypertrophied and dilated. The left was normal. . . . The tunics of the aneurismally enlarged pulmonary artery exhibited the same changes seen in aneurisms of the aorta.

ARTICLE VI.

GOSSYPIUM HERBACEUM. AN INVESTIGATION OF THE PHYSIOLOGICAL EFFECTS OF GOSSYPIUM HERBACEUM MADE IN THE MATERIA MEDICA LABORATORY OF JEFFERSON MEDICAL COLLEGE (and submitted as a Thesis for the Doctorate). By J. CHARLES MARTIN, M.D., of Martinsville, Indiana.

THERE have been several examinations of the bark of gossypium herbaceum. It seems, however, that each investigator failed in identifying the principle which gives to fresh gossypium its therapeutic value. The earliest analysis was made in the year 1856, by Mr. Robert Battey, and the result was published in the *American Journal of Pharmacy* for that year. However, nothing of importance regarding a therapeutically active agent can be gleaned from the report.

Prof. E. S. Wayne, of Cincinnati (*Nashville Med. and Surg. Journ.*, vol. ix. No. 1, p. vi.), and Mr. H. B. Orr, of Nashville, Tenn., made experiments in which they attempted the isolation of an active principle, but the results of their investigations were unsatisfactory; no crystalline principle was found. To Mr. J. U. Lloyd, of Cincinnati, I am indebted for the following report of his investigations of gossypium, and for a more complete account of the result of his laboratory experience with the drug, I refer the reader to the *Proceedings of the American Pharmaceutical Association* of the year 1876.

"The characteristic of fresh or recent gossypium bark resides in the fact that it yields a *yellow tincture* which in a few hours changes to a rich red. I am convinced that this colouring matter is intimately connected with the therapeutical value of the drug, if, indeed, it is not the real active principle, for an extract in which this principle is destroyed or absent, proves to be worthless as a remedy. According to Prof. E. S. Wayne (1872) and Mr. W. C. Stæhle (1875) this body is related to the resins. Mr. W. A. Taylor examined the bark in 1876, and regards it as a *chromogen*, stating that it dissolves pale-yellow and that the solution changes to red."

The following named ingredients were found in the bark of the root: gum, albumen, sugar, starch, tannic and gallic acids, chlorophyll, iodine, caoutchouc, black resin, red and white extractive matter, and oleaginous matter. The last two abound in this plant.

It was first employed by physicians of our own Southern States; Dr. Bouchelle, of Mississippi, being among the first, if not *the* first physician who employed it in practice. It was used in the treatment of intermit-

tent fever, and with such apparent success that one man enthusiastically states, that were he compelled to dispense with quinia or cotton-root, he would hold to the latter. It is no doubt from the presence of iodine *anti-periodic*, but of course not to be compared to the cinchona alkaloids, though I should think it useful in the treatment of the malarial cachexia, enlarged spleen, etc. (*American Journal of Pharmacy*, July, 1872, p. 289).

Many physicians claimed great merit for it in the treatment of *amenorrhœa* and post-partum hemorrhage. The presence of gallic and tannic acids accounts for its efficacy in hemorrhage after delivery.

Garrod (*Essentials of Mat. Med. and Therapeutics*, American ed., 1864, p. 190) says: "The cotton-root is said to promote the contractions of the uterus in the parturient female."

But in the Southern States of our own country there seems to be almost a general belief in the abortifacient powers of the drug, that is to say, a special influence to *initiate* uterine contractions in the pregnant state.

Dr. Porcher, in his work *Resources of the Southern Fields and Forests*, after speaking of the uses of the medicament in the treatment of disease, says:—

"It appears, moreover, to have a *specific* action on the uterine organs. Dr. Ready, of Edgefield District, informs me (1849) that his attention was first called to its emmenagogue properties, by an article which appeared in the *New Orleans Medical Journal* some years since. He has since used it in suppression of the menses, but more particularly in cases of flooding, and with entire success. It seems to produce as active contractions of the uterus as ergot itself."

Dr. Geo. B. Wood (*U. S. Dispensatory*, 14th ed., p. 454) says:—

"The root of the cotton plant has been employed by Dr. Bouchelle, of Mississippi, who believes it to be an excellent emmenagogue, and not inferior to ergot in promoting uterine contractions. He states that it is habitually and *effectually* employed by the slaves of the South for producing *abortion*, and thinks that it acts in this way *without injury to the general health*." (*West. Journ. Med. and Surg.*, Aug. 1840.)

Dr. Bellamy, of Columbus, Ga. (*Atlanta Med. and Surg. Journ.*, Oct. 1866, vol. vii., No. viii. p. 337), fully confirms the statements made by Dr. Bouchelle. Mr. Weatherby, however, denies that, within his observation, these statements are true.

Dr. T. J. Shaw (*Nashville Med. and Surg. Journ.*, 1855, vol. ix., No. 1, p. 4) has used it to a very large extent in his practice, and thinks it equal to ergot as a *parturient*, whilst it is attended with much less danger.

Stillé and Maisch (*National Dispensatory*, 2d ed., p. 677) say:—

"The only virtue of cotton-root consists in its action on the uterine system. It has long been used (so it is reputed) by the female negroes of the South to produce abortion. There appears to be but little doubt that it acts like ergot on the uterus."

From these comments on the action and uses of cotton-root it will be seen that there is a good deal of evidence to show that it has the power to promote uterine contractions, and from the statements above quoted it

would seem to be equally as valuable as ergot in the parturient state. However this may be, the statements of Drs. Bouchelle and Bellamy should be carefully examined. How any drug can act powerfully enough to produce such physiological changes in the womb as must of necessity take place when abortion is produced, and accomplish this without injury to the general health of the subject, seems inexplicable. That this medicine is used in attempts to produce abortion in the female negroes of the South, I do not deny. But I do not believe, from our investigations and from the results of our experiments as to the physiological action of this drug, that it has the power to *initiate* uterine contractions; and in the cases where it is reported that abortion was produced, there were agents used far more potent or some accidental condition was present that produced the result. Were it true that this drug had the power claimed for it, there is little doubt but that it would be in the hands of every abortionist, and would be a mighty power for evil. As a question of this kind can be settled only by properly conducted physiological experiments, I have undertaken the study, and submit my results in this thesis for the Doctorate. In all the experiments I used a preparation (fluid extract) prepared by Mr. J. U. Lloyd, of Cincinnati, O., from *recent* bark of Gossypium herbaceum, gathered from the root of the *living* plant after it reached maturity and just before the boles opened.

Experiment 1.—Oct. 20, 1880. 9.12 A. M. Injected under the skin of a small frog ♏x of the fluid extract of gossypium. After waiting twenty minutes, and there being no marked effect, I gave ♏x; in half an hour the animal became somewhat dull; I injected ♏x more, and in five minutes the frog was under the influence of the drug, being very dull and stupid, and not attempting to move unless irritated. He was suspended by a cord through the nose and his toes touched with acetic acid. In twenty seconds he drew up both legs; this was repeated in a few minutes and there was then no attempt to get rid of the acid. 10.20. The sciatic nerve was now exposed, and on mechanical irritation there were slight muscular contractions. On the application of electricity there were vigorous contractions. The chest was opened at 10.30, and the heart was beating six times per minute, but with good, strong contractions. Mechanical and electrical irritation caused the heart to beat more forcibly and more rapidly for a short time.

Experiment 2.—Oct. 21. 8.44 A. M. Injected ♏xx into medium-sized frog. 9.08. The animal was dull. Injected ♏x–ʒss in all. The frog came under the influence rapidly. There was impaired motion. Sensation but slightly impaired. 9.32. The frog was suspended and both legs touched with acetic acid. He immediately drew up both legs. 9.46. Injected ♏x. 10. No more marked effect. 12.10. There was nothing further noticed, excepting, that the animal was more dull and stupid. I think the fact that there was no more marked effect from the quantity given, was due to some of the drug being wasted or lost in its administration. 12.24. Injected ♏x. 12.34. The frog is now fully under the influeuce of the medicament. The sciatic nerve was exposed, and mechanical and electrical irritation produced marked muscular contractions. 12.45. Frog suspended and both legs touched with acetic acid, and in five seconds he drew up both legs. 12.56. Chest opened. The heart was beating regularly, 26 times per minute, with good, strong contractions. Mechanical and electrical irritation caused the heart to beat more forcibly and rapidly for a short time.

Experiment 3.—Oct. 23. 8.50. Injected ♏xx into small frog. In five minutes it came under the influence of the drug. When placed on its back the frog was unable to turn over. Great want of muscular power. Pinching the skin

caused muscular movements. 9.10. The sciatic nerve was exposed. Mechanical irritation produced muscular movements. Electricity, interrupted current, caused strong contractions. 9.18. Frog suspended and both legs touched with acetic acid, and in five seconds he drew up both legs. 9.25. Chest opened and heart found to be beating sixteen times per minute; good, strong, and regular contractions. Mechanical and electrical irritation produced more rapid contractions.

Comments.—These experiments are very uniform in results, and throw a strong light on the physiological powers of the drug. In the first place, the large amount necessary to produce definite results, is an important fact. The stupor, inattention to surrounding objects, lowered perception of impression, and diminished muscular activity, are probably due to the effect of the drug on the cerebrum.

State of Motor Function.—The sciatic preserves its irritability; on irritation, muscular contractions ensue. Muscular contractility is unimpaired, and the muscles respond to chemical, mechanical, and electrical stimulation.

State of Sensibility.—At first sensibility is unimpaired. On pinching, or application of acetic acid, the animal attempts to get away; after a time, however, and on the exhibition of a larger quantity of the drug, sensibility is so far diminished that no amount of irritation causes the least movement. Is this reduction of sensibility due to the state of the sensory nerves, of the spinal cord, or of the cerebrum? Most probably the last. Why? No lessening of sensibility occurs until the stupor becomes profound, and no diminution of the reflex function takes place until the cerebral functions—perception of sensations—is lost, apparently.

State of Reflex Functions.—On touching the legs with acetic acid, the frog suspended, the legs are drawn up indicating a ready appreciation of pain, and preservation of the reflex actions.

State of Circulation.—There is no change, either of depression or stimulation of the cardiac function.

Experiment 4.—Oct. 23. I divided the medulla of a small frog and isolated the sciatic nerve by ligating all the tissues and dividing the femur. 11.40. Injected ℥xxx. 12.45. Chemical and electrical irritation to the leg not ligatured caused muscular contractions. The same applications caused contractions in the muscles of ligatured limb. Pinching the nerve produced movements. Reflexes not abolished. Sensation unimpaired.

Experiment 5.—Oct. 27. Divided the medulla of young frog, and isolated the sciatic nerve as in previous experiment. 9.20. Injected ℥xx hypodermically, and at 9.40 the tests were applied. Mechanical irritation produced muscular contractions in both limbs, and the sciatics of the two sides responded in the same way. 10.15. Chest was opened, and heart found to be beating twelve times per minute, with good, strong contractions. There was no paralysis.

Comments.—These experiments demonstrate that gossypium has no action on the peripheral or spinal nerves. The responses of nerve and muscle are precisely the same in the limb cut off from the general circulation as in the other extremity. The reflex functions, and motility and sensibility are the same after the division of the medulla. Hence, the stupor noted after the large doses is due to the cerebral effects of the drug.

Experiments on Warm-blooded Animals:—

Experiment 6.—Nov. 20. 9.15 A. M. Injected into the peritoneal cavity of female rabbit f℥iij of the fluid extract. 9.35. The animal is decidedly intoxicated, has a staggering gait. 10.27. The rabbit now lies on its side completely relaxed. Does not attempt to move unless irritated. There is no paralysis. 11 A. M. The animal is somewhat stupid, but is coming from under the influence of the drug. This rabbit was supposed to be pregnant. Nov. 22. The effects of the previous administration of the drug having worn off; at 9.10 A. M. I injected f℥v of the fluid extract into the peritoneum. The animal became influenced very rapidly, and in 10 minutes was unable to walk. The stupor went on increasing, until at 3 P. M. the animal died.

Sectio Cadaveris.—The uterus was not impregnated. There was no hyperæmia of the womb or of its appendages, which were in every respect normal.

Experiment 7.—Dec. 15. 9 A. M. Injected f℥iij of the fluid extract into the peritoneal cavity of a guinea pig. In ten minutes the sow was dead, having been overwhelmed by the rapid absorption of the medicament. There were no convulsions nor uterine contractions.

Sectio Cadaveris.—The animal was pregnant, the womb containing two fœtuses. There was no hyperæmia and no apparent action in any part of the uterine system.

Experiment 8.—Dec. 20. 1.05 P. M. Injected f℥ij of the fluid extract into the peritoneum of a doe rabbit, supposed to be pregnant. The animal became dull and stupid; otherwise, there were no other symptoms differing from those seen in previous experiments. Dec. 22d. 9 A. M. The rabbit used in previous experiment having fully recovered, I injected into the peritoneal cavity f℥ss of the fluid extract. The animal died in a soporific condition two hours later.

Sectio Cadaveris.—The womb contained two fœtuses. There was no evidence of any uterine action, or other conditions indicating a special tendency to affect these organs.

Experiment 9.—Dec. 22d. 1 P. M. I injected f℥ij of the fluid extract into the peritoneum of a doe rabbit, pregnant. The dulness and stupor were well marked; but no signs of uterine contractions. The animal was allowed to fully recover, and forty-eight hours afterward was given a fatal dose, f℥ss. The animal died in two hours and twenty minutes, without any signs of uterine action.

Sectio Cadaveris.—The womb contained one fœtus.

Commentary.—The above experiments on impregnated rabbits are very interesting and probably have a high degree of importance. In the first place, we note that the effects on warm-blooded animals possess a general resemblance to those on cold-blooded: a gradually increasing stupor, impairment of motility and sensibility, but only in the same ratio with the cerebral depression. In the second place, the entire absence of uterine action from even toxic doses should be remarked. It is well known that rabbits conceive and abort with equal facility. When these experiments were going on, an impregnated rabbit, on which some experiments with picrotoxine were being performed in the laboratory by Prof. Bartholow, aborted. Much constitutional disturbance followed, and the animal died from puerperal metritis and peritonitis. That there was no change in the appearance or condition of the uterus, ovaries, and pelvic peritoneum, in any of my cases, seems conclusive against the view, that this remedy possesses the power heretofore ascribed to it, of initiating or promoting uterine action.

ARTICLE VII.

MECHANISM OF FORCEPS LABOUR AND THE PRINCIPLES OF FORCEPS CONSTRUCTION. By W. H. STUDLEY, M.D., of New York.

IT is self-evident that the proper construction and use of the obstetric forceps must be intimately related to, if not entirely dependent upon, a tolerably thorough knowledge of the shape, the planes, and the curves of the female pelvis, together with those of the fœtal head and the mechanism of the passage of the latter through the former.

The Chamberlens in England, about the middle of the 17th century, supposed to have been the inventors of the obstetric forceps, gave to their instruments the cranial curve only. They were straight forceps, with a curve on the flat in each blade, calculated to fit the general cranial convexity. About a hundred years later, Levret, of France, and Smellie, of England, contested the honour of adding to the cranial curve that of the pelvic curve, consisting of a concavity of the upper or anterior edges of the blades and a convexity of the lower or posterior ones, together with an upward or anterior bend of the blades at the shanks of the handles. These curves and bends have passed through many modifications to suit the fancies of would-be improvers; but in the main they have added but little if any improvement to those of Levret and Smellie. From their time the forceps underwent no material change until Tarnier, of France (or, as Dr. Smith, of Philadelphia, would have it, Hermann, of Berne), gave us a forceps with an additional curve, viz., the perineal curve. In regard to the respective merits of these varieties of forceps, as also with a view to the deduction of some fundamental principles of forceps construction, I propose to discuss them briefly in the light of the study of the pelvic shapes, planes, axes, etc., together with the laws of the cranial descent in natural labour.

The teaching in regard to the planes and axes of the female pelvis hitherto held, and almost universally acted upon, is as follows: The plane of the superior strait corresponds to a line drawn from the top of the sacrum to the top of the symphysis pubis. The plane of the inferior strait corresponds to a line drawn from the tip of the coccyx to the bottom of the symphysis pubis. The general axis of the pelvis is a line formed by the junction of the cutting points of the axes of all the planes represented by lines drawn from different points in the sacral curve to a point outside of and beyond the pubes, where the planes of the superior and inferior straits cut each other. This general axis is almost universally represented as beginning with the axis of the superior strait, and gradually departing from it in an anterior or pubic direction, and never, so far as I have consulted diagrams of different authors, in a posterior or sacral direction. Although not positively asserted, yet this curve is represented as being

close to, if not coincident with, an arc of a circle formed by placing one point of the compass on the junction of the prolonged planes of the superior and inferior straits, and sweeping the other from the middle of the plane of the superior strait until it cuts the plane of the inferior. In accordance with the views thus suggested, obstetrical writers and teachers have hitherto inculcated the doctrine that the fœtal head enters the superior strait in a direction corresponding to a line drawn perpendicularly to its plane. Now, this prevailing representation of the pelvic curve and the doctrine based thereon are erroneous, and the evil influence which they have exerted on the manipulation of the forceps has resulted, in my estimation, in the most disastrous consequences. If it shall turn out to be that the head does not enter the superior strait in a line with its axis, but in one that cuts it at quite an angle, and it shall be made to appear that the general pelvic axis is a line departing from the axis of the superior strait in a posterior direction instead of an anterior one, it must be plainly evident that the practice hitherto followed of varying the handles pubicwards from the moment the head enters the pelvic excavation until its exit, is one which not only materially frustrates the accoucheur's efforts, but endangers the mother and child. Who shall estimate the percentage of fœtal marrings and pubic injuries entailed by these misdirected and therefore harmful tractions? If any one will take the average female pelvis and draw a line from the lumbo-sacral junction to the top of the symphysis pubis, the diagrammatic representation of the plane of the superior strait, he will find that this line forms quite an obtuse angle with the upper third of the anterior face of the sacrum and an acute angle with the upper fourth of the posterior face of the pubis. In other words, the upper third of the sacral and the upper fourth of the pubic faces looking towards one another are not parallel to the axis of the superior strait, do not depart from it in an anterior direction, but do follow a line departing from it in a posterior direction. It is, therefore, simply impossible for the head to enter the pelvic excavation in the line of the axis of the superior strait. From the different measurements which I have made, it must do so in a line forming posteriorly an angle of fifteen to twenty degrees with the axis of the superior strait. I say that it *must* take this course, and the reason is that the bevelling of the upper posterior face of the pubes against which the head impinges, compels it to do so, and, in obedience to the law of moving bodies—preserving the line of least resistance—it glides under the receding face of the sacrum.

Now while it is clear, that, if this pelvic axis be strictly pursued in making our tractions, it will be in a curve quite at a distance posteriorly to the one generally represented, and in all difficult labours should be the one followed, yet the general pelvic excavation for some three inches below the superior strait may be regarded and practically is a straight tube, whose axis is that of the superior strait. Take a piece of stove-pipe some

four and a half inches in diameter; let one end be a strictly transverse cut representing the superior strait, and the other an oblique one two inches from the anterior end of the superior strait, and three inches from its posterior end, and you will have a fair diagram of the average planes of the pelvic tube for that distance. If a line be drawn from the promontory of the sacrum to the junction of the third and fourth bones, or about the middle of the fourth bone, it will be seen to be at right angles with the plane of the superior strait, and hence parallel to the axis of that strait. This line will be found to be about three inches in length, describing a chord of a somewhat shallow circle, and leaving a distance from the deepest point of that circle of from one-half to five-eighths of an inch. Again, if a line be drawn as a tangent to the posterior surface of the pubes, it will be found to be perpendicular to the plane of the superior strait, parallel to the axis of that strait, and hence parallel to the sacral chord just described. This tangential line representing the pubic plane should be about two inches in length, reaching, therefore, a point from a third to half an inch below the lower boundary of the symphysis pubis. Why do I extend the pubic plane to this point? I do it in order to reach the true pubic arch occupied by the fœtal head in the process of birth. Cazeaux and others give the depth of the symphysis pubis as about one and a half inches. Now a glance at the average female pelvis will show that the cranio-pubic arch just alluded to leaves a recess of a small arc at its top about one-third of an inch in depth. This little receding arc, whose chord is from an inch and a quarter to an inch and a half in length, subserves the purpose of protecting the urethral canal and its bulb from injury during the exit of the child's head. Below this little receding arc the ischio-pubic rami may be imagined to continue their arcs until they meet, and then we have the true cranio-pubic arch. As if to emphatically exhibit this fact, it will be observed, in looking at the pelvis, that the columns of this arch are distorted outwardly as if a rounded body had been forcibly expelled from the pelvis, whilst the bones were soft, and had pushed them before it. If, then, this be the true pubic arch, it is evident that it is wrong to begin the line representing the plane of the inferior strait at a point nearer than about one-third to one-half of an inch below the bottom of the symphysis pubis.

Now as regards the sacral boundary of the inferior strait, it seems to me from all reasonable considerations that the coccyx should be excluded. All agree that it is a movable bone, as pliable in a backward and forward direction as any of the soft parts between its tip and the fourchette; and why it should ever have been thought a necessary part in the measurements of the planes and straits of the bony pelvis, is unaccountable to me. With its exclusion the terminus of the sacral end should be the tip of the last bone of the sacrum. According to the old measurements, a straight line drawn from the sacro-vertebral angle to the point of the coccyx measures about four and a quarter inches, while the curved line of the sacrum

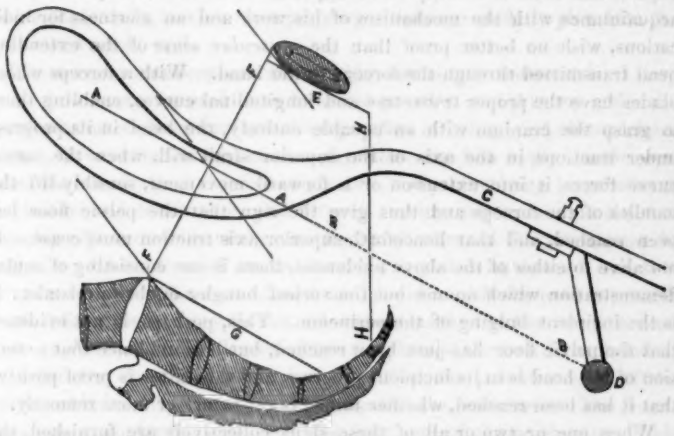
measures about five and a quarter inches. My lines of measurements—excluding the coccyx—would be respectively three and three-quarter inches for the straight one, and four and a quarter for the curved one.

The plane of the inferior strait then would be represented by a line beginning in front or at the pubic end two inches below the front terminus of the superior strait, and three and three-quarter inches below the posterior or sacral end of the same strait; in other words, the inferior strait is represented by a line beginning about a third or a half of an inch below the symphysis pubis, and terminating at the tip of the last sacral bone. It hence results that the front or pubic plane of the pelvic excavation is deeper or longer, while the sacral plane is shorter than hitherto usually represented. The old representation that the pelvic excavation is only an inch and a half deep in front, while its sacral sweep behind is five and a quarter inches, is to be corrected by that which describes it as two inches deep in front, while the posterior or sacral sweep is four and a quarter inches. Now let it be observed that the fourth bone of the sacrum, just about the point where the chord or the plane of the sacrum hitherto described strikes, has a sharp bend forwards, and that bend, together with its prolongation in the last bone of the sacrum, constitute the fixed bony portion of the pelvic floor. This sacral chord or straight plane of the sacrum, as before said, is about three inches in length. Now if the pelvic excavation were to be regarded as rigidly bounded by this plane behind and by the pubic tangent or plane in front, and the bony pelvic floor is where I have located it, it is evident that the child's head, from the time it entered the superior strait until it reached the pelvic floor, would travel in a straight direction the distance of at least three inches—that being the length of the sacral plane, and there being no sacral push to project it forwards until it reached the sharp sacral bend to which I have alluded. That direction, too, would be in strict correspondence with the axis of the superior strait, for the planes of the pubes and the sacrum are parallel to that axis.

For all practical purposes, then, so far as directions in the use of the forceps for this portion of the pelvic excavation are concerned—*i. e.*, in making tractions from the superior strait down to the pelvic floor—it would be sufficient to state in general terms that the blades should be applied with their longitudinal axes corresponding to the axis of the superior strait, and that tractions should be made in a line with it until the head reaches the pelvic floor, when and where, by the impingement of the sharp sacral bend against it, the head is projected forwards and extension begins. It would be sufficient, I say, to inculcate this general direction; for, although a departure from the axis of the superior strait does actually take place in the majority of instances in a backward direction from it, yet it is so slight that but little hindrance can be encountered, except when the head is located at the very brim; and in all cases where, in consequence of a disproportion of head and excavation, the descent is rendered difficult. In such

instances the rule should be to apply the blades and make tractions in a line posterior to and forming an angle of some fifteen or twenty degrees with the axis of the superior strait. But some general rule is desirable for the inexperienced and the unmechanical, and therefore, I say again, it is sufficient to

Fig. 1.



A, A. Axis of superior strait. *F, F.* Superior strait. *H, H.* Inferior strait. *G.* Sacral plane. *E.* Pubic plane. *B, B.* Traction line. *C.* Index handle. *D.* Traction handle.

say that tractions should be made in a line of the axis until the pelvic floor be reached, and until that be accomplished, whatever we do, we must in no wise vary the tractions in a direction anterior to that axis. It is scarcely necessary to give the reasons why we emphasize this latter point. To the most obtuse it must be clear that in just the ratio in which we vary the tractions in an anterior direction from that axis, in just that ratio do we render our efforts futile by impinging the fœtal head against the pubes. I have no hesitancy in hazarding the statement that in full $\frac{99}{100}$ of forceps labours the chief difficulty encountered is due to these untimely anterior tractions, coupled with the faulty curve of the ordinary forceps. But of this anon. Thus much for the indications until the pelvic floor be reached.

Let us now turn our attention to the evidences as to *when* it is reached and the *indications to be followed* from that point until the fœtal head is brought out of the vulva. Of the evidences that the head is brought down to the pelvic floor, and its further progress must be toward the inferior strait, we are in possession of at least *three*, either one of which, when fully appreciated, is sufficient to point out the indications as to the variation of our tractions. The first of these depends upon the *sense of palpation*, the second upon the *muscular sense*, and the third upon the

sense of sight. A digital examination with the index finger directed along the vaginal surface of the perineum and over the surface of the coccyx will readily determine whether or not the head is on the pelvic floor. When the forceps are not in the hands of an expert, this, perhaps, is the simplest and surest method of deciding that fact. But the expert, and even the inexperienced, possessed of an ordinary amount of acquaintance with the mechanism of his work and an alertness for indications, wish no better proof than the *muscular sense* of the extending head transmitted through the forceps to the hand. With a forceps whose blades have the proper transverse and longitudinal curves, enabling them to grasp the cranium with an equable entirety, the head in its progress under tractions in the axis of the superior strait will, when the sacral curve forces it into extension or a forward movement, sensibly lift the handles of the forceps and thus give the sign that the pelvic floor has been reached, and that henceforth superior axis traction must cease. If not alive to either of the above evidences, there is one consisting of ocular demonstration which no one but the veriest bungler ought to mistake: it is the incipient bulging of the perineum. This, perhaps, is not evidence that the pelvic floor has just been reached, but it is evidence that extension of the head is in its incipient progress, and this latter is proof positive that it has been reached, whether immediately before or more remotely.

When one or two or all of these signs collectively are furnished, the indications are clear that the handles of the forceps must be varied in an anterior direction, and that tractions must now leave the axis of the superior strait, and follow that somewhat irregular curve that sweeps under and around the pubic arch. This part of forceps labour is attended with as many if not more difficulties and dangers than that which brings the head from the superior strait to the bony pelvic floor; and, singular as it may seem, I regard these dangers and difficulties as lying in an exactly opposite direction to that usually urged by the books and teachers. The anxiety hitherto manifested has been in regard to the danger threatening the integrity of the perineum by making tractions in the perineal direction; to avoid this, a strenuous warning has been urged to elevate the handles too early rather than too late, and the result has been in but too many instances that the head has been turned out by a prying-lever process, inflicting not only perineal laceration,—just the danger sought to be avoided—but contused wounds of the pubic arcade which has served as a fulcrum for the forceps shanks, and cuts of the vagina, and in some instances of the ischio- and pubio-coccygeus muscles, by the posterior end edges of the blades. If the forceps have well-fitting blades, and the head is snugly held by them, it is easy to see how by such a manœuvre the top of the occiput is made to hitch under and against the pubic arch as a pivotal point, and the forehead and the face forcibly swept out by a long radius against all of the soft parts anterior to the coccyx. Why should not the

perineum and recto-vaginal septum be lacerated under such circumstances? If the blades be defective in their curves, either too straight longitudinally or too flat transversely, so that the parts of the head seized are only two antipodal bosses upon and around which they can turn as easily as a button on a door, it is again easy to see how readily the shanks of the forceps are made to impinge against the ischio-pubic rami, while the posterior blade ends, leaving their proper position, are made to plow into the posterior vaginal wall.

These representations are not fanciful, nor simply theoretical. I have more than once witnessed them in actual practice, and that too under the manipulation of those who had the reputation of being good obstetricians. I once, in consultation with such a physician, saw him apply the forceps, take his stand upon the foot of the bed, the patient lying lengthwise of the bed instead of across it, and without making any traction as the forceps lay adjusted, deliberately raise the handles toward the pubes, remarking as he did so, "we of course have got to pull in an upward direction in order to follow the curve," and as he did so, lift the patient's lower trunk full six inches from the bed. Inasmuch as the handles were elevated at an angle of only a few degrees above the plane of the bed, I concluded at once that the ends of the blades had caught on the posterior brim of the pelvis, while the shanks were bearing against the pubic arch. The intention was undoubtedly good, but the judgment of the mechanism of his work was dangerously poor, "Ab uno disce omnes." A large percentage of the profession know almost next to nothing of the mechanics of labour, either natural or instrumental. It is not enough to tell such men—otherwise excellent physicians—to make axis traction. The trouble is, that they have not the faintest practical idea of where the axis is, and let me say that even the expert is in need of some rules to give him his landmarks. How much more, therefore, do the former require them.

But to return to our subject. As between the dangers attending erroneous anterior and posterior tractions, it seems to me that it requires but little consideration to decide their pre-eminence with the former. Tractions against the perineo-coccygeal tissues are after all but a close imitation of the action of the womb which expels the child by pushing down upon the spinal column pointing directly towards the pelvic floor. The forward variation of the head upon the point of that column is the result of the combined action of the womb, the floor's resistance, and the comparative non-resistance of the vulvar opening. Likewise, even undue posterior traction will be attended with a similar result without danger up to a certain point, and that is when the head begins to crowd in the vaginal outlet. If the misdirected traction be then continued, the danger of laceration will of course be imminent. But few can be so stupid and foolhardy with this indication staring them in the face as to continue the traction in a perineal direction; it is too plain in its suggestions, and too forcible in its

commands. Aside from this danger, the chief objection to erroneous posterior traction (which holds in a four-fold force against undue anterior traction) is, that the efforts of the obstetrician are proportionably neutralized, and the labour retarded. It is a universal law in mechanics that in forcing a body through a canal, the course to be followed is a line marked out and balanced by its opposing resistances. That line will be the resultant of the respective forces of those resistances. And now what is that line, beginning with incipient extension to the very outlet; and what if any are the rules by which it is to be followed? We have said that the indications furnished by that extension coming through the muscular sense, sense of palpation and sight, are that the handles of the forceps should be varied from the axis of the superior strait in an anterior direction.

That line to which we have just alluded—aside from its being a general curve, has no fixed boundaries for its greater part, nor are there as in the bony pelvis any fixed points in its environing canal, from which any measurement can absolutely define it. Every head traversing it must by its own peculiar dimensions vary it to a certain extent. It is, therefore, partly an ideal one. Nevertheless, like the solution of a simple problem on given conditions, it is readily found and followed by observing the two following rules: 1st, As we gradually raise the handles with the advancing progress of the head, frequent digital examinations should be made to determine the contiguity of either the shanks or proximal upper edges of the blades to the pubic arch, remembering that they should hug that arch without touching it; 2d (presupposing a proper forceps with snugly fitting blades so that the head will hold the forceps as well as the forceps the head), we should sensitively and implicitly follow the course suggested by the impressions or bearings of the handles against the hand.

These rules I consider unerring guides; if followed faithfully we need have no fear of going wrong. They exclude any dependence upon a fancied, theoretical curve which at best must be ever subject to each individual's judgment.

With the indications and rules in forceps labour thus hastily considered let us now turn our attention to the subject of forceps construction best calculated to fulfil them. In arriving at a decision let us take up in order the three typical forms of forceps which have been presented since the time of the Chamberlens. The Chamberlen forceps, it will be remembered, were perfectly straight in their longitudinal axis (with the exception of the cranial curve) from the tip of the blades to the tip of the handles. Can such a forceps fulfil the indications when the head is at the brim of the pelvis or in the pelvic excavation at an appreciable distance above the pelvic floor? This question may seem superfluous in the light of an almost universal dismissal of their employment since the time of Smellie and Levret. But let it be noted that no longer ago than when the International Medical Congress met in London, Prof. Lareswitch, of Cracow,

"maintained that the only curve essential to the forceps was the head curve—the pelvic and perineal curves being not only unnecessary but mischievous; that the perineal curve is superfluous inasmuch as the perineum can be readily distended as far as the coccyx without injury, while the pelvic curve increases the resistance to the passage of the head, endangers the soft parts, and renders the power of making traction in the axis of the pelvis difficult if not impossible. Moreover, the direction in which traction should be made is decided by the muscular sense."

With the last clause of Professor Lareswitch I in a certain sense agree, as my preceding remarks have shown; I also think him correct in regard to the *pelvic curve* if he limits it to the relationship which it holds to the handles of the ordinary forceps; but when he maintains that the straight or Chamberlen forceps can fulfil all the indications in forceps labour better than any other I, and I think the profession generally, most emphatically dissent from him. I unhesitatingly deny that in a primipara or in a multipara (whose perineum has not been badly lacerated or enormously relaxed) the perineum can be forced back to the point of the coccyx without making it a powerfully elastic fulcrum whose action is to throw the anterior edges of the forceps forward onto the anterior parts of the pelvis and thereby endanger them. I hold that it would be dangerously difficult, if not wholly impossible, to apply such a forceps at the brim, when in order to get them properly adjusted the perineum has to be simultaneously forced backward by the handle, while the end of the blade is gouging its way along until it has plowed its adjustment to the side of the head. Again, supposing it possible, conceive them applied at the brim where, according to my showing, the traction should be made, in a direction all the way from fifteen to twenty degrees posterior to the axis of the superior strait, could the handles very well push back the coccyx too? Even if so, or in the unsuccessful attempt to do so, would not the perineal fulcrum thrust the head onto the anterior pelvic brim, and thus frustrate the object in view? According to Cazeaux "the extent of the perineum in its ordinary condition is three inches, viz., from the point of the coccyx to the anus there are one and three-quarter inches, from the anus to the vulva one and one-quarter inches." This three inches of strong, muscular, fibrous tissue it is necessary to thrust back until its whole extent is annihilated in order to reach the point of the coccyx before the blades of the Chamberlen forceps can be adjusted. This is impossible without inflicting a barbarous violence.

Were the perineum and the coccyx entirely out of the way, then we could have no better forceps, for then the longitudinal axis of the blades, and the axis of the presenting part of the cranium, and the axis of the superior strait, and the points of resistance and traction in blade and handle would all correspond and act in one general shaft line. This is all that could be desired, and this, let it be distinctly understood, is just what must be accomplished in any properly constructed forceps whose work has to regard the coccyx and the perineum in the place where nature has put them. In other words, a properly constructed forceps will not disturb or injure the

perineum, nor will they in turn be interfered with by them, while they accomplish all that the Chamberlen forceps can do with the coccyx and perineum left out.

What of the working of the Smellie and Levret forceps—the ordinary straight-handled forceps having the cranial and pelvic curves? The invention of the pelvic curve undoubtedly grew directly out of the difficulty of applying the Chamberlen forceps when the head was not well down in and in the act of emerging from the pelvic excavation. That it greatly facilitates the introduction of the blades and their application to the head when it is appreciably above the pelvic floor, there can be no dispute. Herein consists their chief merit, and it is no small one. In the hands of an accoucheur skilled in the mechanism of forceps labour, and when only comparatively weak tractions are required, the instrument can be used to great advantage. But where the conditions are such in one instance, there are twenty at least where they are the reverse. In order that such a forceps shall be manipulated with efficiency, and without danger to the mother or child, it is evident that traction must not be made in a line corresponding to that of the handles. If there be any one point in forceps delivery that is clearer or more settled than another, it is that of axis traction. Traction, therefore, in a line of the handles of such a forceps is a transgression of this plain mechanical law.

At the last meeting of the American Gynæcological Society held in September, in this city, Dr. Albert H. Smith, of Philadelphia, made the subject of axis traction the theme of his paper. He gives credit to Ojeander, of Göttingen, in 1799, for being the first to call attention to this subject. The *Medical Record*, in an abstract of his paper, makes him say, that it is essential that pressure should be made downwards upon the lock of the instrument in a line parallel with the axis of the superior strait or the strait of that portion of the pelvis in which the head of the child is engaged, and at the same time upward leverage made with the other hand on the handles of the forceps. This was the principle enunciated by Ojeander, and it was that which Dr. Smith believed all obstetricians would adopt sooner or latter (mark the admission that such a practice has never been and is not now carried out by the profession as a whole). He emphatically affirms that axis traction can be made in this manner by the ordinary forceps. Whether or not we agree with him on this point, we see that he makes a strong and sensible advocacy of the necessity of axis traction—the unavoidable inference of which is that the general longitudinal axis of the blades shall coincide with the pelvic axis, and that traction in a line of the handles is positively to be avoided.

The validity of this position no one can gainsay. But it is all very well and it sounds very plausible to insist upon what should be done with the ordinary forceps, without considering for a moment the question of their capacity of application in all cases, or giving one single rule whereby one

may positively know that the blades are axially applied, or even if one did know, how he is to be sure that he is making a pressure on the lock "*exactly*" in the direction of the plane of the pelvic axis with one hand, and exactly antagonizing such a pressure by a counter one with the other. Could two persons of even acknowledged skill be selected who would manipulate the ordinary forceps with anything more than a general approximation to what is represented should be done with them. All forceps of the ordinary variety do not have the same pelvic curve. What but a vastly variable judgment in the great army of accoucheurs is to decide as to the axial line—and hence the axial application and subsequent axial traction of these different forceps? How varied are the pelvic positions of the patient whereby the brim and axis are changed, and who, whether he be expert or otherwise, can be guided by anything more than a general *guess* as to the direction of traction? How far back must the handles be carried in order to have the blade properly applied to the head at the brim? How much allowance is to be made for the fulcrum force of a rigid perineum? If due regard be paid to that condition is it not almost certain that the blades will be applied diagonally across the pelvic excavation and not in a line of the pelvic axis? If under such circumstances the rule of Dr. Smith to depress the blades when making traction in a direction of the pelvic axis be carried out, who does not see that they will be very likely to slip from the head and impinge with their posterior edges upon the sacral portion of the pelvis?

In cases of easy delivery, in consequence of ample pelvis or proportionately diminutive head, Ojeander's rule may work tolerably well. But in difficult cases of labour, depending upon a proportionately small pelvis, a large head, or malposition, this leverage and fulcrum action of the forceps — this double-hand antagonism robbing traction of its needed force—proves not always a safe procedure, and in but too many instances an inefficient one. The accoucheur initiates his delivery by an attempted accordance with the rule, uncertain and indefinite though it is; but he soon finds that he needs all of his strength, without any to spare for antagonizing, to pull with the index and middle fingers in the rings or on the crossbars, which nearly all who have devised forceps after the ordinary variety have provided for this purpose. Traction then is shifted from the line of the pelvic axis to that of the handles. What is the consequence? Why it is plain! that the concave edges of the blades are pulled more or less directly against the pubes. The more curved the blades the more they hook around the pubic bone, and hence the greater the resistance to the progress of labour. No matter how far back the handles may be depressed, although varying them in that direction facilitates matters much better than by varying them frontward, yet the strictly handle line traction must tend to force the head against the pubes and away from the pelvic axis. Is it strange that labour is difficult, painful, and dangerous

under such circumstances? Is it strange that we occasionally have a separation of the symphysis pubis?

The next and last variety of forceps under consideration is that with the cranial, the pelvic, and perineal curves combined. The perineal curve given to the ordinary forceps by Tarnier, by some of late accredited to another, I consider of vast importance if properly utilized. Just exactly what useful end it subserves in the apparatus given to us under the name of the Tarnier forceps I confess my inability to see. The Tarnier forceps are neither pulled by their handles properly so called, nor is traction made from anything attached to those handles. They are simply used for the purpose of adjusting the blades, and binding them to the head. If Tarnier had contented himself with simply bending upwards the blades of the ordinary forceps to about double the angle which they now hold to the line of the handles, they would have subserved precisely the same purpose and end of those which he has given us. Inasmuch as with them traction is made with separate rods, hinged to the blades, while the handles are purposely allowed to freely oscillate with the movements of the head, it matters little, so far as I can see, whether the shanks be bent so as to lop over the perineum or remain in the same kind of relationship which holds between the blades and the handles of the ordinary forceps. But, as remarked before, if properly utilized, either for the purpose of allowing traction to be made by the handles direct, as with the ordinary forceps, or, far better still, of furnishing a hold in the handles from which an attached handle descending to an axial point may be made use of, and giving such a relative direction to those handles as to make them a positive, not an uncertain, index as to just where the blades are in the pelvic track (both of which all-important advantages I have endeavoured to achieve in the forceps which I have devised), then the perineal curve becomes of vast consequence. Thus environed it enables the blades of the forceps to be applied to the head in axial line at any point from the pelvic brim to the pelvic floor, without either disturbing the perineum or being in turn disturbed by it, and renders the forceps virtually straight, thus enabling them to be drawn open always in axial line, and wholly obviating the necessity of wasting strength and puzzling the judgment by the antagonizing, double-hand leverage action, so necessary in the ordinary forceps. Surely no one but a prejudiced theorist, or a blind devotee to the antique, or a babe in mechanics, can object to the perineal curve under such circumstances.

Objection has been made to the perineal curve on the ground that in case of slipping, the soft parts, and especially the perineum, are in far greater danger of being wounded than with the ordinary forceps. But allowance must be made for the indulgence of this idea when it is remembered that it seems next to impossible for many in the profession to think of the perineal curve in any other relationship than that in which it is exhibited in the Tarnier forceps. In that relationship—in other words,

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at the mercy of Tarnier's traction rods—I readily subscribe to the prevailing idea. But shorn of those adjuncts, I seriously doubt that the perineal curve can be attended with any more, if as much danger as the ordinary forceps when they slip. When forceps slip and lacerate the perineum, they inflict the injury by their sudden expansion, coupled with the backward pressure of the perineum, and not by the cutting posterior edges of the blades as many suppose. If this be the case the advantage is with the forceps having the perineal curve, for they exert no pressure on the perineum, and their expansion can be no greater than that of the ordinary forceps.

In regard to the question of the liability of slipping as between the ordinary forceps and those having a perineal curve, again I think most decidedly that the latter have the advantage. Aside from the prevailing fault of undue elasticity, which, in order to make a just comparison, must be ascribed equally to both kinds of forceps, the reason why the ordinary forceps are more liable to slip than those which have the perineal curve, is because of the difficulty and uncertainty of making axial application with them, and even if made the impossibility of making axial traction in all difficult cases, as I have shown, and these are just the cases where slipping is most liable to occur. But by way of digression on this question of slipping let me say that no forceps should be constructed so as to entail the curse of the infernal qualities of watch-spring blades and whalebone shanks. The perineal curve in a forceps constructed with a due regard to strength sufficient to make the blades stay where they are adjusted, will, because of axial application and traction, never be likely to permit slipping, even though subjected to a traction force twice as great as that ordinarily exerted to make the common forceps slip. Now this construction consists not in thickening the blades for at least two-thirds of their distal extremities, but in limiting it to their proximal ends and the shanks. The little bulk here added cannot in the least encumber the pelvic canal.

Leaving now the perineal curve, the next feature of the Tarnier forceps to which we will turn our attention, and one which seems a necessary accompaniment, where the blades are drawn by traction rods or by some other device than the handles, is the *binding screw*, by which the blades are immovably fixed *after* adjustment to the head. Fault has been found with this arrangement on the theoretical ground that the head might thereby be unduly and dangerously compressed. Never was there a more egregious error committed than by the entertainment of this notion. Those who indulge in it have no idea as to its proper use and management. Under such circumstances it is infinitely superior to the *hand* management of the ordinary forceps, in which pressure is left entirely to the decision of a judgment oftentimes greatly unbalanced by the fear of the forceps slipping. Guards against undue pres-

sure by the old forceps, either in the shape of the resisting bar, intervening napkin, etc., are very unreliable and useless things in the great majority of cases. They are for the most part practically discarded, and the obstetrician knowing that compression must be made commensurate with the amount of resistance, and whether fearful of the slipping of his forceps or not, being compelled to make pressure by the very act of traction, he is naturally led to make more compression than is necessary, and the result is the mutilated heads which we so often witness. The use and management of the binding bar are as follows: The blades having been adjusted to the head the handles are approximated by the hand with a force which the judgment can readily decide is safe and sufficient to make inelastic and unyielding blades stay where they are put (and none but such are fit for use), and then the bar is simply set by its screw. This binding remains only during the period of making temporary traction. When it ceases the pressure of the blades is immediately taken off by unfixing the screw with a simple turn or two, and throwing out the bar, when perfect rest is afforded during the intervals. When tractions are again to be made, the bar is instantly thrown into its notch, where, with a reversed turn or two of its screw, it is again set as before, only to be unadjusted at the cessation of the temporary traction, and so on to the end. By this means, one guided and guarded by undisturbed judgment, danger from undue compression is efficiently warded off rather than incurred.

But the great and peculiar features of the Tarnier forceps are the traction rods. So far as I have been able to learn, these traction rods were designed to have in view for their chief object the freedom of the handles, in consequence of which they might serve as an index to the progress of the head through the pelvic canal, and suggest the directions in which tractions should be made. In other words, a pointer or bowsprit fixed to the child's head, moving under an uncontrolling, and, therefore, uncertain power, was to take the place of muscular sense and the brain, and so be the dumb indicator, the sign guide of just where to pull. From the first they were looked upon with suspicion, and the instinctive impression has grown into a conviction enforced by experience, that they are both useless and dangerous. The *pushing* of the fœtal head through the pelvic track by uterine contractions, whereby flexion is made at the brim in most instances, and maintained until the bony part of the pelvic floor is reached, when extension begins *is one thing*, and it is the one natural thing to be imitated; but it is quite another where the head is *pulled* through the same canal by an instrument which has no controlling or guiding power as to the direction to be pursued. When forceps are applied above the pelvic floor, and especially at the brim, they seize the head in a state of flexion, and this condition should be maintained if possible by the proper guidance of the forceps.

The hinged rods of Tarnier permit no such governing power. By a possible faulty application of the blades, a not exactly proper presentation, and certain unlooked-for resistances, the head may be made to begin extension too soon, and thus a vertex may be converted into a face presentation. The possibility of their doing this is not based on theory alone. A distinguished physician and obstetrician in this city told me, some six or eight months ago, that this accident had occurred twice to his positive knowledge under the employment of the Tarnier forceps. Another danger is the possibility and great probability of their slipping off the head during a quick rotation or a sudden extension (all the more likely to happen because of this hinge-movement) in consequence of which the sudden exit of such a complicated vaginal derrick would be likely to inflict serious harm to the perineum. But apart from these dangers, I consider the traction rods useless. 1st, they are useless as furnishing an index to what should be the proper movement of the head in its descent, as we have just shown, inasmuch as the upward movements of the handles may mean chin progress and occiput retrocession rather than natural extension and descent of the head along the curve. 2d, they are comparatively and especially useless in trying to fulfil the great indication of making traction in a line of the pelvic axis (since this end can be obtained in a far simpler and surer way). Dr. Smith says, that "by making traction blindly" (you see he considers the handle-index utterly useless), "the Tarnier forceps cannot do what it proposes to do—make axis traction at all." Had Tarnier not been so enthusiastically led away with the idea of the moving handle-index—which idea was the conceiving mother of the rods—he undoubtedly would have given to the profession an excellent forceps. By the downward bend of the proximal end of the traction rods he evidently intended to make the point of traction in a line coinciding with the long axis of the blades. Now, if he had, instead of attaching hinged rods to the blades, attached a fixed handle to the lock, descending to a point which would fall on the line coinciding with the longitudinal axis of the blades, he would have accomplished this intention. It is evident that the force of traction can be transmitted as well through such an arrangement as through the dangerous and uncertain traction rods, and because the points of traction and resistance, and the blade axis must necessarily thereby act in one line, and can therefore always be under the absolute knowledge and control of the operator, such an instrument must necessarily be vastly superior in execution, and infinitely freer from danger.

It is such an instrument as this which, in the main, I now offer to the profession. Some two or three years ago, when my attention was particularly directed to the Tarnier forceps by an article in the American Obsterical Journal, from the hand of Dr. Fordyce Barker, I was instantly struck with the uselessness and danger of the traction rods, and immediately set to work to devise a forceps which, upon a somewhat extensive trial

within the past year and a half, not only in mine, but in other hands, have proven themselves capable of doing all that the Tarnier forceps possibly can do, while they do far more, and that without complication or danger. They can scarcely be said to be a modification of the Tarnier forceps, for although I have borrowed from them the perineal curve and the binding bar, yet their action is based on entirely different principles, while the relation which the handles hold to the blades and both to the pelvic planes under an observed rule which renders the direction of the handles a certain index as to just where the blades are in the pelvis, surrounds them with features which will hardly entitle them as a Tarnier modification. A description of them will perhaps be best understood by beginning a detail of their construction from the ordinary forceps as a foundation.

Conceive of the blades of the ordinary forceps to be curved up or rather bent up on their shanks, so that an average line of the blade and the bend shall be at an angle to the line of the handles of about forty-five degrees—the average bend of the ordinary forceps being about twenty degrees—then conceive of a backward or downward bend of the shanks at about their middle, or at such a point as will make the line of the handles perfectly parallel to the longitudinal line of the blades and two inches from it. In this double bend you get a perineal curve of exact dimensions, the special object of which is, besides the non-interference with the perineum, to enable the line of the handles, when brought in coincidence with the pubic plane, to indicate that the axis line of the blades is in coincidence with the axis of the superior strait. It has already been shown that the plane of the pubis is at right angles to the plane of the brim or superior strait, and hence must be parallel to the axis of that strait. It is only necessary, therefore, with such a constructed forceps, on applying them to the head anywhere above the pelvic floor, to bring the handles to the plane of the pubis (which is parallel to the general vulvar plane) in order to positively direct the blades in the axial line of the brim. Now it is the easiest thing possible to determine the general plane of the pubes, all that is necessary is to place the index finger on the upper edge and the thumb on the under edge of the pubes, and its plane is seen at a glance. The other and distinguishing feature of my forceps, is a shaft adjustable to a button on the under end of the lock-post descending obliquely to the traction line, which is only a prolongation of the axial line of the blades, and terminating in a ring through which is passed transversely a wooden handle similar to, but shorter than that of Tarnier. No one can dispute the advantage of such a handle, both as regards the economy of strength to be laid out, and the efficiency of traction to be made, for by it tractions can be made on the blades just as they should be made, viz., in a line with their axis and that of the pelvic axis, without at all disturbing the perineum or being disturbed by it, thus making them virtually a straight forceps with all of their acknowledged advantages.

Although the lock is peculiar and of easy adjustment, yet no special claim is made for advantages over those of other forceps. There are some features of the blades and shanks which differ from those of the generality of forceps, and which I claim should enter into the principles of forceps construction :—

1st. The blades are of more than the ordinary width, and possess a more decided concavity, both transversely and longitudinally. They are thereby enabled to grasp the head with a hug which is distributed generally and evenly over the cranial surface, from their tips to their junction with the shanks, by which means an undue pressure on any one point is avoided, an upward or downward tendency to glide from the cranial convexity is prevented, their central rotary action on the sides of the head as pivotal points is guarded against, and lastly the muscular perception is greatly conduced to by the firmer bearing of the handles, indicating thereby the course which the head is naturally pursuing.

2d. The proximal ends of the blades and the shanks are stiffer than in the great majority of forceps. They are such as to allow of almost no separation within the bounds of any reasonable traction. Limber forceps are simply barbarous, they not only do no good but they slip off and bruise the head and lacerate the perineum, and if by the prudence of the obstetrician they are prevented from doing this, they slip just far enough to concentrate all the bearing or pressure on the tips of the blades, and thus convert them into gouging or cutting instruments.

The binding screw is, in all essential respects, the same as Tarnier's, and hence needs no comments.

Fig. 2.

Such is the instrument which I would offer as possessing many and material advantages over both the forceps in ordinary use and those of Tarnier. If they are used in accordance with the rules which I have endeavoured to lay down in regard to the mechanism of forceps labour, I am sure that not even the tyro can go astray, while I am equally sure that the expert will appreciate them as an efficient aid.[1]

[1] These forceps can be obtained of Phillip H. Schmidt, 1311 Broadway, New York.

ARTICLE VIII.

TWO VESICAL CALCULI WITH NUCLEI OF BONE, RESULTING FROM A GUNSHOT WOUND.

By J. M. BANISTER, A.B., M.D., Assistant-Surgeon U. S. Army, Post-Surgeon at Fort Reno, Indian Territory.

IN the *American Journal of the Medical Sciences* for October, 1880, under the heading "Lateral Lithotomy, with the Successful Removal of a Calculus and Seven Pieces of Necrosed Bone from the Bladder of an Indian Scout, Nineteen Months after the Reception of a Gunshot Wound," I attempted to give the history of a very interesting case of gunshot wound of the rectum and bladder, involving the pelvic bones, which had a short time before been under my charge.

Recently, I have been so fortunate as to secure the bladder and its contents from the patient in question, and my object, in again bringing this case to the notice of the profession, is to give a short history of the patient prior to his recent death, and to describe the exceedingly interesting pathological specimens removed at the *autopsy*.

In order that the links in the chain of the history may remain unbroken, I think it well to give a brief *resumé* of the earlier history of the case, trusting, however, that the readers of the present article will refer to my report as originally given.

Chauch, or Chalk, an Arapahoe Indian, 30 years of age, was wounded in battle near Fort Supply, I. T., September 13, 1878. "The ball, after penetrating the saddle-tree, entered the right natis, passed through the pelvis, wounding the rectum and bladder, and made its exit just beneath the left pubic arch, carrying away a small portion of the arch, and wounding the left epididymis and scrotum. For many weeks feces and urine passed through the posterior wound, or wound of entrance. There was a little infiltration of urine into the scrotum, and it was at one time enormously distended with fecal gases. *Splinters of bone* were discharged or extracted, from time to time, from the wounds of exit and entrance, and on one or two occasions *fragments of wood were expelled per urethram.*" The attending surgeon, Assistant-Surgeon T. E. Wilcox, U. S. A., was never able to detect any foreign body in the bladder.

In January, 1879, the patient returned to his tribe wonderfully improved; all wounds had healed, and feces and urine were passing through the natural channels. In the following July he suffered from a very obstinate attack of cystitis, the result it was supposed of the gunshot wound of the bladder. He habitually passed an abnormal amount of urine, and constantly suffered from the passage of bits of necrosed bone *per urethram*.

Upon February 29, 1880, the patient came under my care suffering from most distressing symptoms of cystitis, and his general condition was pitiable in the extreme. His urine was abnormally increased in quantity; was of an offensive ammoniacal odour, and strongly alkaline in reaction; was constantly loaded with mucus and pus, and frequently tinged with blood. There was no trace of phosphates, and no albumen. Micturition was increased in frequency, and almost each act caused the greatest agony from the passage in the urine of bits of necrosed bone; his suffering from

this cause was almost continuous from this date until that of the operation two months later. Only a hasty exploration of the vesical cavity was, under the circumstances, deemed expedient, but by its means was demonstrated the existence of a foreign body in the fundus of the organ.

Upon April 25, 1880, the operation of lateral lithotomy was performed as a last resort. A calculus and seven pieces of bone were removed, and one encysted calculus, which resisted every effort at dislodgment, was left *in sitû*. The patient recovered from the operation without a bad symptom, with the exception of a slight intercurrent attack of pleuritis, and not quite three months later, returned to his people cured as far as the bladder was concerned, making, of course, due allowance for the presence of the encysted stone, from which he was suffering no inconvenience. The calculus and bone fragments removed were presented to the Army Medical Museum, their numbers being 7020 and 7021 in the "Surgical Section." A full description of these specimens can be found in my article before referred to.

I shall in passing, call the reader's attention to the *passage per urethram of fragments of wood* shortly after the patient was wounded, and shall only remark that I have never been able to find a similar occurrence recorded in the history of military surgery.

I shall now give the subsequent history of the case.

After the departure of my patient from the hospital July 18, 1880, I lost sight of him until March 26, 1881, when at his request, I visited him in his camp and found him again suffering from severe bladder symptoms. I was informed that he had been in this condition for nearly two months; at his own request the patient was removed to the Post Hospital, Fort Reno, I. T., and, upon sounding the bladder the following morning, I at once detected the presence of a calculus. The urine was then subjected to a thorough chemical and microscopical examination, and no contra-indication being discovered, I determined to perform a second lithotomy as soon as the patient's condition could be sufficiently improved. He was at once put upon supporting treatment, and attempts made to mitigate the vesical symptoms by the usual measures. After a two weeks' continuance of this treatment, the patient's condition was sufficiently improved to justify the operation, but when the subject was mentioned to him he positively refused to give his consent. His immediate family and friends, from some superstition of theirs, also vehemently opposed the operation and finally insisted upon carrying him back to the camp.

About a month later, the patient was brought back to the hospital in a dying condition; no idea of surgical interference was now, for an instant entertained, and the patient's expected death occurred May 13, 1881, the sixth day following.

I was very desirous of holding a thorough post-mortem examination, and securing the bladder, kidneys, and pelvic bones, but the Indians maintained such a close watch over the body that the first mentioned viscus could alone be obtained.

The necessary dissection at the *autopsy* was performed by Acting-Assistant-Surgeon, W. W. Hall, U. S. A., to whom I am much indebted for his valuable assistance. The bladder and its contents proved a full recompense for the trouble taken to secure them, and I shall now describe these very interesting specimens, first referring the reader to the description of the course of the ball, as above given.

Upon opening the abdominal cavity and exposing the pelvic viscera *in sitû*, the bladder was found firmly bound to the rectum by inflammatory

adhesions, and likewise adherent in front to the left pubic bone, close to the symphysis, and at a situation corresponding to the point of exit of the ball, as well as to the location of the encysted calculus discovered, and left in its sac, at my operation a year before. So hurried was the removal of the bladder that, under the circumstances, it was necessary to separate this organ from its pubic attachment, and impossible to remove more of the rectum than that portion before mentioned as attached by inflammatory adhesions to the vesical wall. On the mucous surface of this piece of bowel could be seen the well-marked cicatrix of the old wound, and upon opening the bladder and examining its posterior wall, an exactly similar scar was plainly visible at the same situation, the two viscera *being firmly bound together at this point.* Two very interesting calculi were found occupying the vesical fundus; the sac of the stone formerly encysted was empty. The bladder wall was thickened, and its internal surface presented the characteristic "retiform arrangement" due to hypertrophy of the muscular fibres, a condition so commonly found in cases of long standing inflammation of this organ. No evidence of present necrosis of the pelvic bones was discoverable.

The calculi discovered in the vesical cavity proved of the greatest pathological interest. The larger of the two, evidently, from its shape and size, the one left encysted at the lithotomy in 1880, was ovoidal in shape and weighed 244 grains Troy; its surface was thickly coated with crystals of ammonio-magnesian phosphate.

Upon sawing through this calculus, I discovered a well-marked *splinter of bone playing the part of a nucleus*, while the mass of the stone was composed of phosphatic matter arranged in concentric layers.

The smaller body was more irregular in shape, was also coated with crystals of ammonio-magnesian phosphate, and weighed 77½ grains Troy. Its mass was found to *consist chiefly of necrosed bone*, around which was its phosphatic envelope.

An interesting subject for investigation, in connection with these two specimens, is the probable source of the bone fragments forming their nuclei. It has been stated above that the situation of the encysted calculus, discovered at my operation in 1880, exactly corresponded to the point of exit of the ball, and that at the *autopsy* (in May, 1881) the anterior wall of the bladder was found adherent to the pubic bone at the same point. It is probable, therefore, that the nucleus of the larger stone had the following origin. The wounded anterior wall of the bladder having, in consequence of the inflammatory process, become adherent to the injured pubic bone, a splinter, chipped or possibly exfoliated from the bone in question, remained in the wound and served as a nucleus for the phosphatic deposit. This stone had evidently been liberated from its sac by the ulcerative process, and had dropped into the bladder fundus some months before the patient's death.

In the case of the smaller formation, the origin of the nucleus cannot be so definitely traced. It could not possibly have remained in the cavity of the bladder at the conclusion of the lithotomy *a year before*, as every precaution was then taken to avoid such an oversight, and at the time of the patient's departure from the hospital, he was suffering from no symp-

toms referable to such a cause. It is very probable, therefore, that, like the bone fragments removed at the lithotomy, it made its way into the bladder by ulcerative absorption, having in the first instance been splintered from the sacrum and driven by the force of the ball into the bladder-wall; that it was not a *recent exfoliation*, was proved by the absence of signs of present necrosis affecting the pelvic bones, as discovered at the *autopsy*, and by the non-existence of fistulous tracks.

This fragment, then, was occupied in effecting its entrance into the bladder for more than two years, but the length of time required does not overthrow the theory above advanced, as a number of cases in the history of surgery will prove. In Case 802, "Medical and Surgical History of the War of the Rebellion, Part Second, Surgical Volume," page 274, a bullet effected its entrance into the bladder five years after the reception of a gunshot wound of the abdomen.

Private George L. Schrimp, Co. C, Palmetto Sharpshooters (Confederate Service), was wounded at the second battle of Manassas, August 30, 1862, the ball "entering the body about an inch to the left of the spine, and about two inches below the last rib, and penetrating the cavity of the abdomen." Upon October 20 he was furloughed, returning to his home, and in March, 1863, rejoined the army and served until the close of the war. Upon May 28, 1867, while ploughing in the field, "he felt something drop somewhere in his abdomen," and began to experience symptoms of severe irritation of the bladder. The patient then came under the charge of Professor F. T. Miles, who sounded the bladder, discovered a foreign body, and on August 3d, 1867, successfully performed the lateral operation for stone, removing thereby "an ounce ball," one-sixth of the surface of which was thickly encrusted with phosphatic matter. In his report of the case, Professor Miles, in answer to the question, "How did the ball get into the bladder?" gives the following opinion: "The only rational explanation is that the ball perforated the external coats, pushing the internal before it, without producing any solution of continuity in that coat, thus preventing any escape of urine until the outer tunics united and closed the opening. The ball was suspended in the wall of the bladder by the invaginated mucous membrane for nearly five years. By its weight it probably induced absorption of the thin membrane, and wore its way gradually through by attrition, until it dropped into the bladder. The deposit on the ball shows that a portion of the ball was exposed to the urine long before it dropped into the bladder."

It is no doubt needless to remind the reader of the great interest naturally excited in the mind of the military surgeon by such a pathological curiosity as a calculus with a nucleus of bone resulting from a gunshot wound, and I shall therefore merely mention that from the whole number of bladder wounds occurring during the "War of the Rebellion," only three such instances resulted.[1]

These instances occurred in the practice of Dr. W. C. Livingston, of New York, Dr. C. Terry, of Columbus, Georgia, and Dr. Hunter McGuire, of Richmond, Virginia, and can be found chronicled in the Second Surgical Volume of the "Medical and Surgical History," the number of the cases being respectively 805, 806, and 807.

[1] See Medical and Surgical History, War of the Rebellion, Second Surgical Volume, page 268.

Surgeon G. A. Otis, U. S. A., the late talented compiler of the "Surgical Records" in the Surgeon-General's Office, thus remarks upon these three cases: "Although Hennen declares calculous formations about bones to be common after shot-wounds, published examples are not numerous, and the three instances resulting from the experience of the war are of unusual interest."[1] A complete list of all on record can be found in Note 3, "Medical and Surgical History of the War of the Rebellion, Part Second, Surgical Volume," pages 276 and 277. In examining this list, it will be seen that of the *twenty-one instances of vesical calculi with nuclei of bone* therein recorded, *fifteen resulted from gunshot wounds*, while the remaining *six* occurred in *civil practice*, and *not* in consequence of such injuries.

Upon the authority, therefore, of the "Medical and Surgical History of the War of the Rebellion," the case described in the present article is the *fourth instance* of "calculous formations" about bone fragments occurring in the United States, in consequence of gunshot wounds of the bladder, and the *sixteenth* on record in the history of military surgery in all countries.

The calculi and bladder obtained in the present instance have been donated to the Army Medical Museum at Washington, the numbers of the specimens being respectively 7074 and 7075 in the "Surgical Section."

ARTICLE IX.

THE INFLUENCE OF METEOROLOGICAL CONDITIONS UPON THE CAUSATION OF CROUPOUS PNEUMONIA.[2] By AUGUST SEIBERT, M.D., of New York.

IT is a well-established fact that the weather, or, to speak more definitely, certain states in the meteorological condition of the atmosphere, have a marked influence upon some of the organic functions of the human body. That this influence is able to cause disease is maintained by some, admitted by a few more, and denied by most authorities. In fact we may term this influence a public secret, nolens-volens known to all, yet hardly nearer its explanation now than in older times, in spite of our better knowledge of the particulars pertaining to meteorology.

The well-known and proven researches and investigations showing the influence of different weather upon the human body in health (as particularly mentioned in Weber's "Klimatologie," Ziemssen) as well as in disease, allow us to logically infer that the same influences are brought to

[1] See Medical and Surgical History, War of the Rebellion, Second Surgical Volume, page 276.

[2] Being an Abstract of a Paper read before the Society of German Physicians, May 1, 1881.

bear upon the causation of acute pathological processes along the respiratory tract, acting as pioneers to the true generators of disease.

For some time past my attention had been called to the greater number of cases of croupous pneumonia, brought to the Department for Diseases of Children in the German Dispensary of New York City, during and after certain kinds of weather. The negative result gained by an inquiry into the literature touching this subject induced me to try and, if possible, gain some certain knowledge regarding this phenomenon. A survey of the leading published opinions on this subject reveals the fact that the "catching-cold" theory has been of late replaced by an extreme scepticism regarding even the smallest meteorological influence upon the origin of croupous pneumonia! The reason for this fact may be found—

1. In the general acceptance of the doctrine of infection.

2. In the experience with cold baths.

3. In the one-sided and defective reports concerning certain climates and their inhabitants.

4. In the want of exact and thorough investigations, which give not only the influence upon the origin of pneumonia of each constituent of the weather *separately*, but also and chiefly the *combined* influence of *all*.

Notwithstanding this drift of leading opinions, even the most radical sceptics do not fail to discuss the probability of a meteorological influence upon the origin of pneumonia in their chapters on this disease, but of course only to arrive at the conclusion that none whatever exists. Thomas (in Gehrhardt's "Handbuch der Kinderkrankheiten, vol. iii. p. 597), for instance, remarks: "Pneumonia is most frequently found during winter and spring," and "this fact entitles us to assume that the prevalence of rough winds, which are also found during autumn, cannot be of marked influence upon the frequency of croupous pneumonia among children."

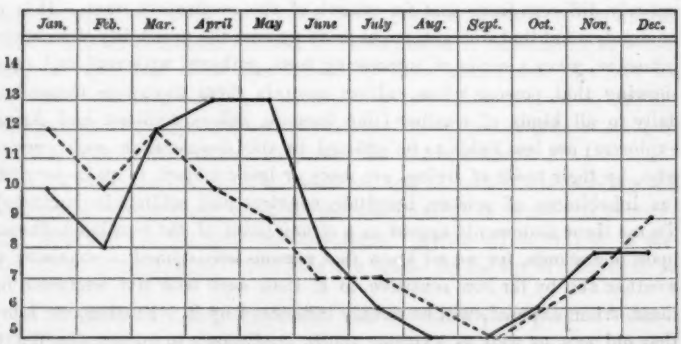
Juergensen (in his "Ætiologie der croupœsen Pneumonie," Ziemssen) coincides with Thomas in holding that the disposition for pneumonia is entirely different from that for catarrh of the respiratory tract. It is to be wondered at that Juergensen, as proof against the possibility of weather-influence, gives a series of interesting facts, gathered with zeal and care, showing that persons whose calling compels them to expose themselves daily to all kinds of weather (like farmers, sailors, soldiers, and Arctic explorers) are less liable to be afflicted by this disease than such persons who, by their mode of living, are more or less confined to an in-door life (as inhabitants of prisons, hospitals, convicts and soldiers in barracks). To me these statements appear as a strong proof of the weather-influence upon pneumonia, for we all know that persons accustomed to exposure to weather are by far less sensitive to it than such who live secluded, for these, when exposed, will be doubly influenced by it. Further, we know that old age, as well as extreme youth, predisposes to pneumonia, not to forget its frequency among convalescents. Thomas admits that children accustomed to exposure to fresh air are by far less liable to be afflicted by

this malady than those confined to closed rooms and poor ventilation. In speaking of a possible influence of the weather, Juergensen goes over its constituents *separately*, arriving at the conclusion that the sudden falling of the barometer "might possibly favour the origin of pneumonia," for "it appeared to him so." The sudden change of temperature "may be" of a limited influence according to the same authority, a conclusion gained by comparing monthly returns—a no doubt easy but somewhat too summary method of working to be of value.

These examples show sufficiently that the leading deductions regarding this important question are arrived at by very superficial investigations. Nowhere have I been able to find even a quotation considering the combined influence upon this disease of the temperature, the humidity, the atmospheric pressure, and the direction and velocity of the wind; not even one sentence could I find in which even two of the weather-constituents were mentioned together in this relation. Yet we know that the physical and pathological influences of the weather-constituents can absolutely *not* be held apart if we intend to be in any way exact and scientific in our investigation. The reasons for the absurdity of separate investigation are ably pointed out in Weber's "Climatologie," in the same work of Ziemssen.

Those authorities adverse to the possibility of a weather-influence try to prove their assertion by claiming that the frequency of pneumonia is very different from that of catarrh of the respiratory tract during the different months of the year. The figures drawn up for this purpose are not very convincing, however. Take, for example, Juergensen's chart on this subject, representing the frequency of pneumonia and that of catarrh as found during twenty-five years in the "Allgemeines Krankenhaus" at Vienna (*vide* chart No. 1). Any one looking at the two lines of this

Chart 1.[1]



[1] In charts 1 and 2 the pneumonia cases are represented by the continued line, and the catarrhal bronchitis by the dotted line.

Chart 2.

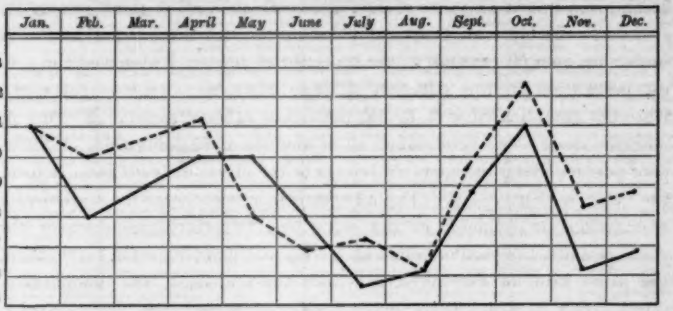


chart with an unprejudiced eye cannot fail to find their similarity remarkable and striking, considering the conglomerated material they represent. To bring a counterpart to this chart, I have gathered all cases of pure croupous pneumonia and all of pure bronchial catarrh treated at the Department for Children's Diseases, in the German Dispensary, New York, during 1878, 1879, and 1880. The lines representing these cases give chart No. 2. Though at the first glance the similarity of these lines seems to be small, yet any one will admit that their *direction* varies seldom and not oftener than in chart No. 1. The main difference lies in the more eccentric running of the line representing catarrh. The by far steadier and less pointed character of the pneumonia line not alone indicates the less frequent occurrence of this disease, but also seems to show that the same or kindred meteorological influences tending to aid the breeding of the two diseases must have been brought to bear more heavily and during a longer period upon the tissues affected with pneumonia than on those of catarrh. A comparison of the mortality statistics of New York City for the last three years shows that pneumonia, bronchitis, and diphtheria give chart lines very similar to those of chart No. 1. Want of space and the minor importance of mortality figures prevent the reproduction of these charts.

It is not my object to prove that catarrh and pneumonia are the same disease, only differing in location and intensity (though C. Veraguth (*Virchow's Archiv*, Bd. lxxxii. Hft. 2, 1880) has recently shown, by injecting a solution of nitrate of silver into the trachea of animals, that the same cause can produce both diseases, the difference being in the length of time allowed to the agent to work upon the tissues); but I do maintain that a marked meteorological influence is brought to bear upon the causation of pneumonia as well as on that of catarrh, and that the meteorological conditions exercising this influence are in both diseases so nearly related to each other as to almost be identical.

For the purpose of detecting the *nature* of this weather-influence, I

have made the following investigation: 600 cases of croupous pneumonia, in children under 14 years of age, were collected, all of them having been treated at the German Dispensary during the last three years, and mostly under my own observation. As a matter of course, I observed the greatest precaution in the selection of these cases, so as only to get such as were not complicated with or did not follow other diseases. For my purpose the cases were good, since all of the small patients were children of poor people, living in tenement houses of the city—districts usually termed the German East Side. The advantages of such cases for statistical investigation are evident, as the same age (two-thirds were under three years of age), the similar mode of living, the poor hygienic surroundings, the same kind of dwellings, and, last but not least, the comparatively small space in which these cases developed themselves, made them extremely well adapted for my purpose. The cases were arranged according to the date of their reception in the dispensary.

In answer to a written request to the Chief Signal Service Officer at Washington, that gentleman placed the official reports of the New York Meteorological Station at my disposal, in the most kindly and encouraging manner; so I was enabled to copy these reports for every day of the years 1878, 1879, and 1880. My notes contained the following for each day of the three years mentioned:—

1. The mean barometer. 2. The mean humidity. 3. The maximal temperature. 4. The minimal temperature. 5. The mean temperature. 6. The direction of the wind. 7. The maximal velocity of the wind. 8. The amount of snow or rain.

By examining the meteorological phenomena of the three days prior to the reception of each of the above 600 cases of pneumonia at the Dispensary *separately*, we gain the following results:—

Barometer.—1. In 461 cases (about 78 per cent.) it was found that a more or less strong *falling* in the barometer had taken place. In the remaining 139 cases the barometer had either ascended or remained stationary.

2. In 352 cases the barometer registered below the mean.

Temperature.—3. In 506 cases (84 per cent.) the *minimum* temperature of the day registered *below* 50° Fahrenheit.

4. In only 129 cases (20 per cent.) the daily range amounted to 20° F. or more.

5. In only 25 cases (4 per cent.) a strong falling of the thermometer was noted during these stages.

Wind.—6. In 302 cases (50 per cent.) *northerly* winds prevailed.

7. In 200 cases (33⅓ per cent.) *northwest* winds had been noted.

8. In 406 cases (67 per cent.) the *maximum velocity* of the wind was 15 *miles* per hour or more.

Chart 3.

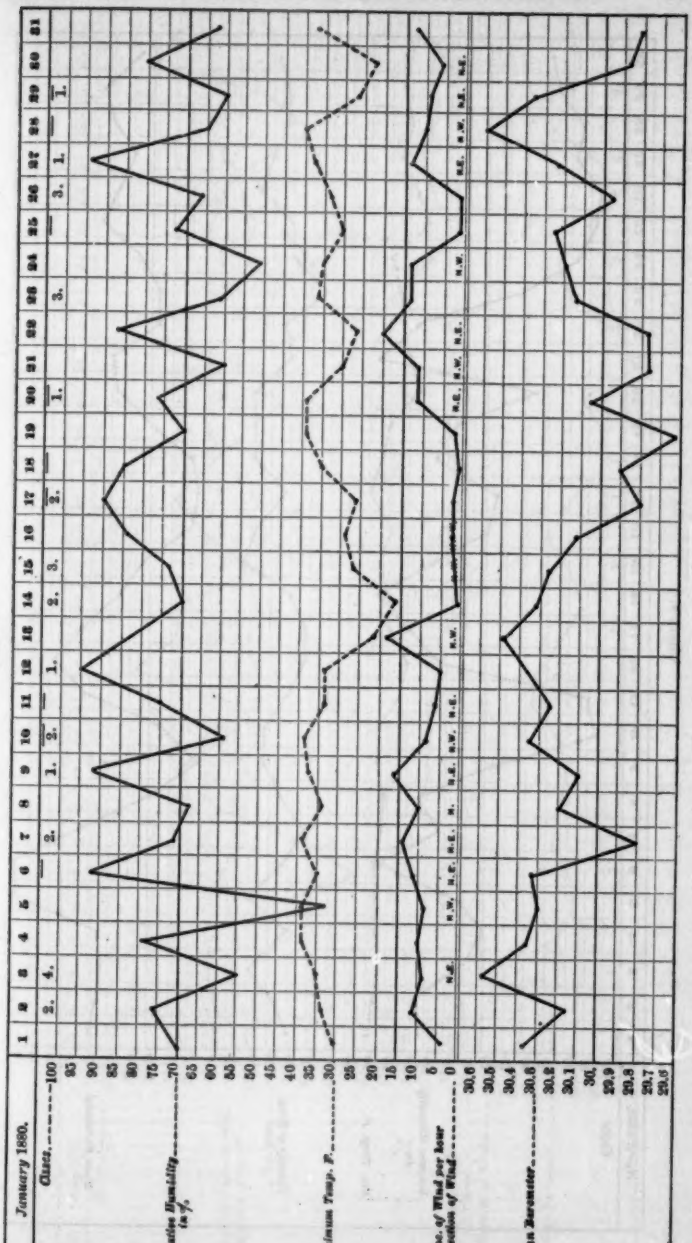

January 1880.
Days 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Relative Humidity in %
Minimum Temp. F.
Velocity of Wind per hour
Direction of Wind
Mean Barometer

Chart 4.

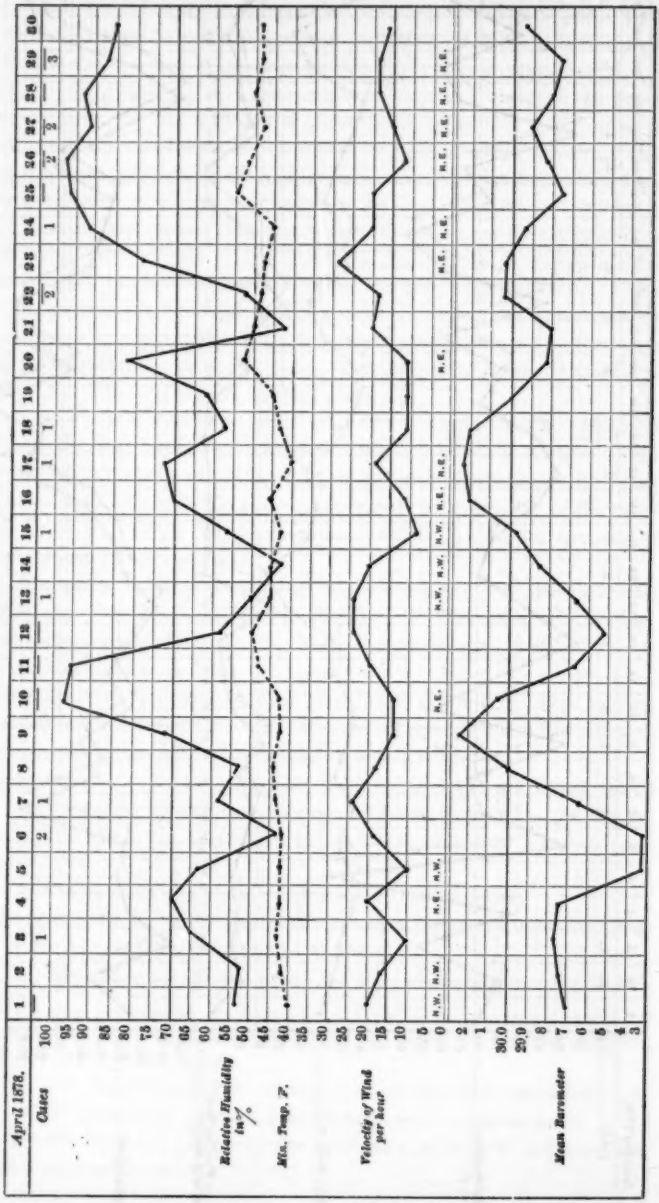

April 1878.
Cases
Relative Humidity in %
Min. Temp. F.
Velocity of Wind per hour
Mean Barometer

Chart 5.

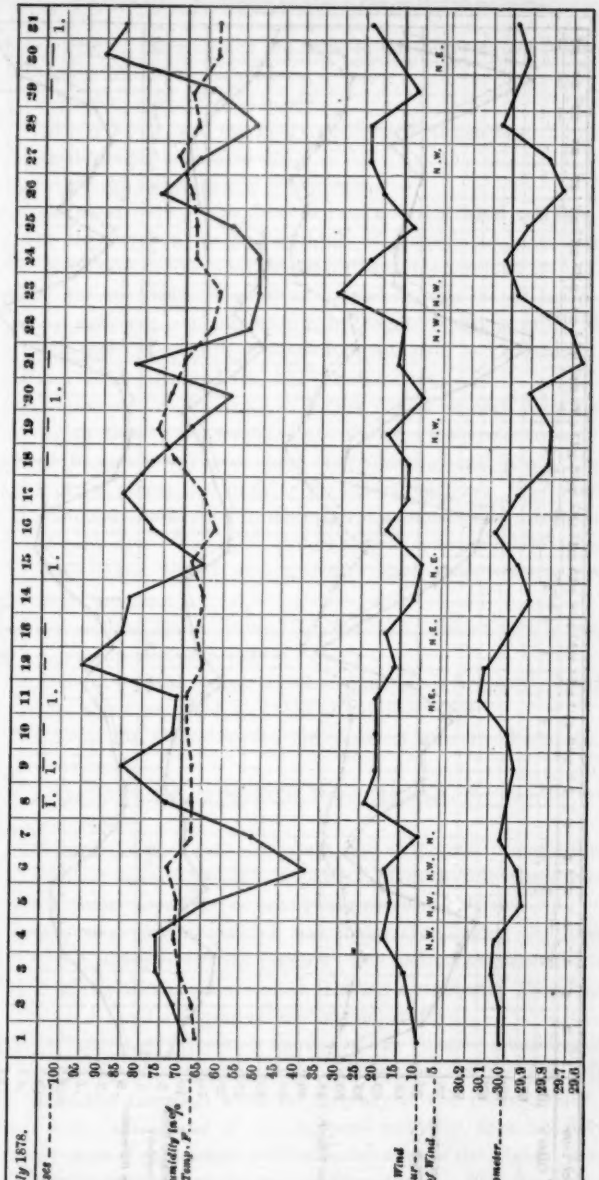
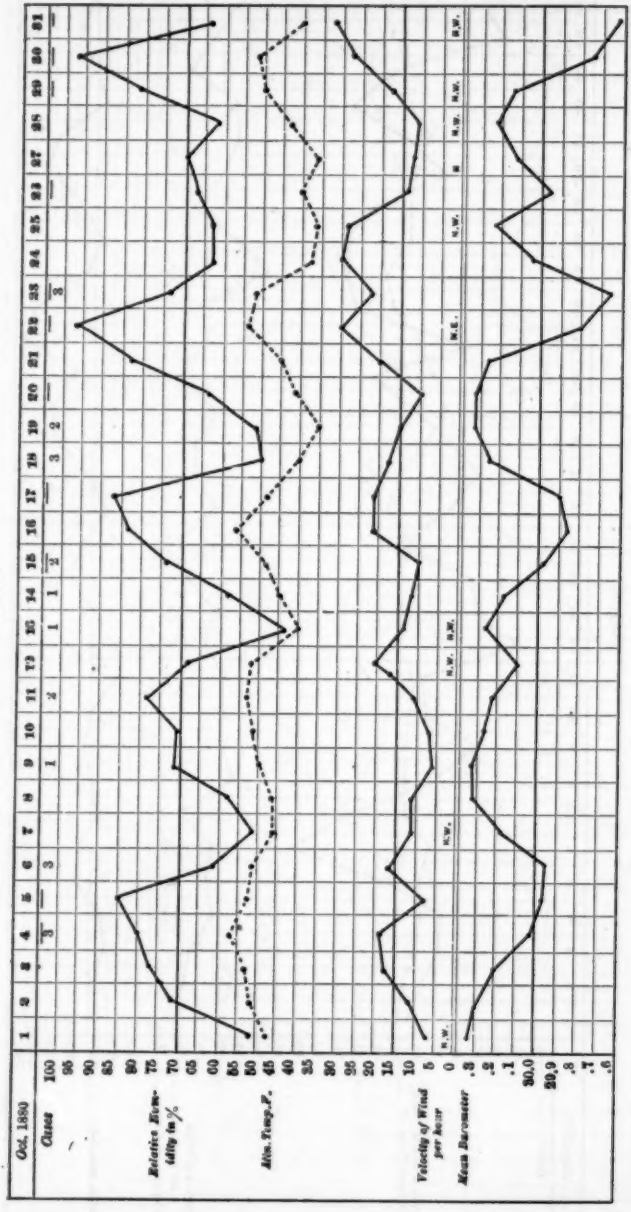

July 1878.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Clouds
Relative Humidity in %
Minimum Temp. F.
Velocity of Wind per hour
Direction of Wind
Mean Barometer
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5
30.2 30.1 30.0 29.9 29.8 29.7 29.6
N.W. N.W. N.W. N. N.E. N.E. N.E. N.W. N.W. N.W. N.W. N.E.

Chart 6.


Oct. 1880
Clear
Relative Humidity in %
Min. Temp. F.
Velocity of Wind per hour
Mean Barometer

On summing up these figures, we come to the following conclusions:—

1. A strong fall in the barometer;
2. A low figure of the thermometer;
3. Northerly winds, and especially northwest; and at last
4. A great velocity of the wind;

seem to favour the production of pneumonia.

For reasons already given above, a result of this kind can *not* be of value, and the only way to give a result of value is to investigate the probable influences of the weather-constituents *together* and at the *same time*. To my knowledge *this* way of proceeding has never before been followed—a sufficient explanation for the negative results of E. Masson ("De l'influence des conditions Meteorologiques sur la Production de la Pneumonie," Diss. Inaug. Bern. 1879) and others.

To best proceed in this manner I drew charts for each month of the three years, containing the graphic lines of each weather-constituent separately, and in such a way as to show the relation of each one of them to either one of the others, and to all of the others together. The number of cases of pneumonia is written in the uppermost square and directly under the date of each day. The thick underlining of a date represents rain or snow. (*Vide* charts Nos. 3, 4, 5, and 6.) Each chart represents one of the seasons of the year.

Even a superficial glance at the lines indicating the *minimum temperature* and the mean humidity shows—

1. That in all months during which pneumonia is frequently found, the line of temperature runs *low*, and that of humidity *high*.

2. The *larger* the space between the course of these two lines, the *more* cases of pneumonia.

3. The *smaller* the space between these two lines, the less frequent do we find pneumonia.

The inspection of *each case* separately, and of the meteorological conditions which must have influenced the patient, gives the following figures:—

1. 554 of these cases (93 per cent.) originated in *cold and moist* air.

2. In 550 cases (92 per cent.) it was found that during the three inspected days a *strong rise* of the humidity line had taken place, either—*a*. During a falling thermometer; or, *b*. During a stationary thermometer; or, *c*. During a small and gradual rise of temperature.

The chief object of interest is the rise of the relative humidity of the atmosphere *during* a descending or an existing low temperature. If the relative humidity *increases* while the mercury of the thermometer is at the same time *falling*, and if this happens suddenly, then not only one but several cases of pneumonia will be found, even if the highest per cent. of humidity does not exceed the mean—70 per cent. *Vide* January chart (on the 25th).

If a strong and sudden rise of the humidity sets in during a stationary

temperature, then we also find cases of pneumonia as well as when a small and gradual rise of temperature accompanies a strong and sudden rise of humidity.

Vice versa: If a sudden and strong fall in the temperature is noted while the humidity remains stationary and above the percentage, we also find cases of pneumonia, but this phenomenon is of rare occurrence.

As the falling of the barometer is coincident with a rise of humidity, it will be unnecessary to say more about them separately.

In those of the 600 cases in which no increase of humidity was found (5-6 per cent.), a greater velocity of the prevailing wind, together with a falling of the barometer, was found.

If a *strong wind* accompanies a *high*, a *rising*, or a *long lasting high* percentage of *humidity*, together with a *low* or (still better) a *falling* thermometer, then the frequency of pneumonia will be found astonishing. Northerly winds, as mentioned before, seem to be of the most influence in this direction.

The final result of this paper may be put into the following form:—

1. The origin of croupous pneumonia is, without doubt, very favourably influenced by certain weather.

2. It is principally the sudden appearance and the long prevalence of cold-moist atmosphere which exercises this influence. That this result coincides remarkably with the latest researches regarding the physiological and pathological influence of cold-moist air on the respiratory tract, is sufficiently known, and therefore only needs to be hinted at.

ARTICLE X.

ACRANIA MONSTERS; WITH REPORT OF A CASE. By EMIL MAYER, M.D., Assistant Surgeon to the New York Eye and Ear Infirmary.

THE comparatively rare occurrence of this form of monstrosity, and the still more infrequent opportunity of post-mortem examination of them when they do present, makes the following case of interest:—

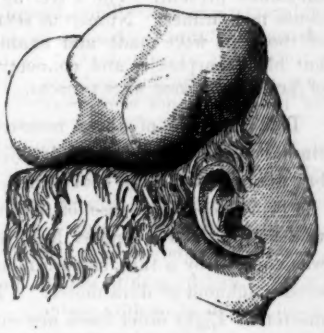
CASE.—I was called on the morning of April 27th to visit Mrs. S., who was in labour at term. Arrived at 10.30 A. M.; found the os thoroughly dilated, pains forcible but infrequent, and membranes at vaginal orifice. The presentation was believed to be breech, as two eminences were felt, the finger entered a cavity and none of the outlines of the face were felt on the surface. The membranes were ruptured; ℥ss ext. ergot. fluid. given, and in a short time the head presented. There was something peculiar felt about this; the patient was sufficiently exposed to examine it, revealing an acrania monster with a brain-like tumour, in place of the cranium, which had two rounded prominences posteriorly, between which, but situated deeper, was the rent the finger had made, and which

extended into the cavity of the skull. It was a left occipito-anterior presentation. The head lay for about ten minutes outside of the vaginal orifice, and no progress seemed to be made, although the pains were vigorous. The shoulders and rest of the child were then delivered at 11.15 A. M., but not until the finger was hooked under the shoulder-joint and the patient thus aided. Duration of labour, three and a half hours. Secundines soon followed.

The child was born dead, and was of a perfectly natural colour. Attempts to resuscitate failed. It had evidently not been dead long, as the mother had felt its movements two hours before the beginning of labour, and they were extraordinarily violent and prolonged, enough to call the attention of the husband to it. This is a point of interest, as will be seen later on.

Fig. 1.

Fig. 2.



Post-mortem twenty-seven hours after birth. Body well developed and very large; the lungs were not inflated, and the other organs of thoracic and abdominal cavity appeared healthy. The head (Fig. 1) was small compared with the body. The face had an idiotic expression, which was made quite hideous by the bulging of both upper eyelids (frog's-lids). The nose was long and flat, the lips thick and separated. The right ear was fully developed and lying with its lobe on a line with the nostril. The left ear was flat, and its lobe was on a line with the mouth as in the diagram. The auditory canals were both normal. Lying directly above the upper lids, the superior portion of the nose, and extending over the whole of the upper surface of the head to the occipital protuberance posteriorly, lay the brain-like tumour, covered by membranes which ran into the hairy scalp on its borders. Anteriorly there were two prominences, one over each eye. Posteriorly (Fig. 2) were the rounded prominences mentioned, with the cavity which bore evidences of being recently made, and a thick, heavy, and short neck. The facial angle was about sixty degrees. The following measurements were taken:—

Occipito mental	5½ inches.
" frontal	5 "
Bi-parietal (its equivalent)	5 "
Sub-occipito mental	8½ "
Circumference of brain	9¾ "

The tumour was about an inch higher than if the cranial bones had been present. The head was placed in stronger alcohol and an incision made (after two weeks) in the median line, from the superior portion of the nose to the base of the occiput, and the bones sawed through to the face with a view to preserve the specimen as nearly intact as possible. On incising the growth on the head an appreciable quantity of fluid spurted out, and posteriorly the incision revealed a dense layer of adipose tissue under the scalp. There was absence of the whole of the frontal bone, except the orbital and nasal portions, the squamous portion of the temporal bones, both parietal bones, and all of the portion of the occipital bone above the protuberance. The tumour presents on incision a number of large cavities, separated from each other by walls of hard tissue, occupying the entire position which the cerebrum and cerebellum would naturally be in. The medulla seemed to be the only perfect portion of nerve substance present. The covering of the tumour was composed of two dense membranes. Numerous sections from various portions of the walls of the cysts were made and examined microscopically, showing nothing but blood corpuscles and connective tissue. No gray cells nor evidences of brain substance were present.

The literature of these monstrosities is scant. Vrolik[1] cites a case similar to the one above, and which, he says, may be called hernia cerebri, acrania, acephalia spuria, microcephalia, hemicephalia, or ancephalia.

Purple[2] reports a case of acrania, in a female child, in which "there was nothing above a point level with the base of the cranium, and this was covered by a thin, smooth membrane, having the appearance of thickened arachnoid or dura mater." The child lived a short time. No post-mortem. Eight other cases are cited in the same article, one of which has some similarity with the present one, that of Mr. Burrows (*Med.-Chir. Trans.*, 1813), as follows: "Head of child appeared very remarkably deformed. The whole of forehead, summit, and a great part of the occiput and brain were deficient, and in lieu of them a substance projected of a light mulberry colour. From the deficiency of bone the eyes appeared to project more than usual. It lived six days, during which it took no sustenance." Förster[3] cites a case in which there was absence of skull from the root of nose to the middle of occiput. "The space is covered by a brain-like body which is divided into two parts, resembling hemispheres, rounded posteriorly, and running anteriorly somewhat to a point. Each of these hemispheres is incompletely divided by deep furrows, into several lobes. This body is covered by a membrane, which on its borders runs into the hairy scalp."

Clippinger[4] reports the case of an anencephalus monster. "Child never respired; auditory canal perfect; pinna of ear unusually small and de-

[1] De vrucht van den Mensch en van den Zoogdieren, 1849.
[2] New York Journal of Medicine, 1850.
[3] Missbildungen des Menschen, 1861.
[4] Medical and Surgical Reporter, Philadelphia, 1879.

formed. There was a serous membrane with a well-marked cicatrix near its centre, that lay on the base of the cranium."

The cause of monstrosities is not a very certain one; among those given are: Influence of parents, as primary disease of semen or ova (faulty development); disease of parents (this is mainly maternal, as women have been known to give birth to monstrosities where there were different husbands); among these are faulty development of ovary, Graafian vesicle, alterations in the tubes, uterus, etc.; also those diseases which disturb the component parts of the blood or the circulation in general, the pelvic and uterine in particular. Psychical, as fright or excitement, and the very doubtful one of mis-seeing. Twins pressing one on the other, the tying of the cord around any one part, are also among the causes given.

Purple (*loc. cit.*) suggests that this tumour is the result of arrested development of the vascular system, which in the normal still supplies the brain and fills the subarachnoid space.

Geddings (Purple, *loc. cit.*) believes it to be dependent upon arrest of development affecting the brain and its osseous coverings.

Vrolik (Purple, *loc. cit.*) states that from some of its forms it is clear that a hydrocephalus existed, followed by disruption. In support of this he says that he has a fœtus of two months, in which the superior part of the skull is wanting, and in which a spongy mass occupies the place of the brain.

Förster (*op. cit.*) says: "A fœtus is as capable of being diseased before as it is after birth. After the fourth month such diseases as inflammation, hypertrophy, atrophy, etc., may occur. These are the congenital troubles. Diseases occurring in embryonic life (to the end of third month) are the causes of monstrosities." He believes that the latter occur *during* the formation of parts, and not afterwards. "Examination of acrania show that in early embryonic life an abnormal serous exudation or dropsy is present."

From these remarks of Förster and of Vrolik, we can readily assume that there was in this case a condition of subarachnoid hydrocephalus in embryonic life, and that the bony structures were prevented from being developed by its presence. This seems to be the only explainable cause, as the woman is perfectly healthy, and has given birth to three healthy children. There was nothing peculiar about her pregnancy, save that she vomited much more than with the others, and had frequent pains in the right iliac fossa. The movements were vigorous, and were felt about five months before delivery.

That these monsters may live for a time is shown by the fact that nearly all of the cases reported by Purple lived a short time, one of them living six days without taking sustenance. Granted that in this case the child had sufficient medulla oblongata to enable the pneumogastric to do its work, the question of interest arises, what caused the death of the fœtus? Was it

caused by the pressure upon the tumour during labour, or did the finger which entered into the substance of the growth press upon a vital part, or, what is more likely, was not that prolonged movement which excited the attention of the husband, two feet away, an intra-uterine convulsion caused by the engaging of the head at the internal os, and consequent pressure upon it?

33 RIVINGTON STREET.

ARTICLE XI.

HEART-CLOT AS A FATAL COMPLICATION IN THE ACUTE FEVERS OF CHILDHOOD.

By JOHN M. KEATING, M.D., Lecturer on Diseases of Children in the University of Pennsylvania, etc.

AT a meeting of the Philadelphia Obstetrical Society, held June 3, 1880, I had the honour of exhibiting some specimens of the thoracic viscera taken from children who died of measles during an exceedingly severe epidemic at the Philadelphia Hospital. At that time I called attention to the value of studying the condition of the heart in such cases, its bearing upon treatment, showing that a fatal tendency lay in the frequency of heart-clot. In fact, in one case a fatal result was brought about by the pressure exerted upon the right pneumogastric trunk, which was squeezed between a dense catarrhal consolidated apex of the lung, and a large indurated bronchial gland, causing irritation of the nerve, slowing of the heart's action, and the formation of a large and firm right-sided heart-clot.

It has been the experience of most practitioners whose practice has brought them in contact with the acute fevers of childhood, especially scarlet fever and diphtheria, that a frequent cause of death is heart-clot, or, in other words, that such patients are prone to fibrinous coagulations, either in the form of embolism or thrombosis, which may be an immediate or remote cause of death. In the epidemic of measles referred to, it was found that this disease not only deserved a place in this consideration, but that this was its most frequent fatal complication; particularly was this due to the pulmonary engorgement which was apt to complicate the attack either in the form of a simple extensive bronchitis, a croupous pneumonia, or that of the catarrhal variety with the resulting vesicular collapse. In fact, it may be regarded as a rule that in a patient whose blood has a tendency to clot as soon as the circulation is somewhat retarded, anything that will interfere with the normal rapid passage of the current must be looked upon as a most serious complication.

Dr. J. Lewis Smith tells us that thrombosis of the cranial sinuses has been known to result from clonic convulsion, as the cough of pertussis, "since both the cough and convulsions retard the flow of blood in the

veins and sinuses within the cranium." He also speaks of sudden deaths in diphtheria due amongst other causes to the anæmia and general feebleness from granulo-fatty degeneration of the muscular fibres of the heart, which is liable to occur in all infectious diseases of a malignant type; or from ante-mortem heart-clots. We see by these statements that another factor enters into consideration as a complication in these affections, namely, the feebleness of the heart's muscle itself from a granulo-fatty change, more or less severe, brought about by the fibrile state in common with all other muscular tissue. Fothergill tells us that irritation of the pneumogastric nerve will, through its influence over cardiac action, retard the circulation, and give an opportunity for clots to form. To enumerate, then, the conditions that may give rise to this undesirable complication, we have first a heart weakened in its muscular tissue, or, owing to an insufficient ventricular contraction due to the rapid action of a weakened heart, a tendency to incomplete emptying of the cavities at each impulse; secondly, obstruction to the free circulation, most frequently due to difficult passage of blood through the lungs, either from the engorgement present, or from improper aëration, such as is seen in cases where false membrane obstructs the air passage, or where intense blood-poisoning exists; and, thirdly, probably due to irritation at times of the pneumogastric termini, or their centre, but a sure cause when the trunk itself is irritated from pressure by enlarged glands, or inflammatory products, as was stated in the case previously referred to by me. Of course, those diseases in which the blood coagulability is intensified, less mechanical obstruction will be required to produce heart-clots, and naturally we find that in diphtheria, the granulo-fatty degeneration of the heart by simply weakening the force of the ventricular contractions, will permit a clot to gradually form and finally carry the case to a fatal termination. So insidiously does this take place that death may have already stamped his victim unconsciously to us, at the time when the most careful examination has laid out the fondest hopes of a speedy recovery. A clot thus formed, may be detached, and washed to any part of the arterial system, giving rise to symptoms the importance of which are dependent upon the degree of mechanical obstruction it produces, and the organ into which it is forced. From this general statement which every practitioner can verify, doubtless, by numerous instances, it is obvious that great stress should be laid upon the early detection of the precursory signs of this fatal condition. There is no pathognomonic symptom which will guide us, there is no one sign that will tell us that the fatal clot is gradually augmenting in size, soon to obstruct the circulation, or to show that a clot, which the post-mortem reveals of an almost white colour, has been forming for a time antecedent to death, whilst the blood current was flowing swiftly enough to part with its colouring matter; we cannot tell when the deposit first

began to form, nor can we say whether when once formed, it would be possible for a reabsorption to take place.[1]

The relative weakness of the radial pulse to the cardiac impulse will only be marked when a fatal fibrinous lining has coated the ventricle or its valve, and the secondary engorgement of the left auricle, and stasis in the pulmonary vein will be merely noticed as the effect of a cause by that time as well marked as itself, and thus both of these signs may follow a weakening of the cardiac wall without the formation of a heart-clot. Auscultation will not give us the same clear insight into the existing conditions, as it would in an adult's heart; especially would this be the case if the deposit does not interfere with the valvular action.

Perhaps in such cases palpation of the heart, by placing the open hand upon the precordia, affords a clearer insight than any other one means. A fair impulse which may, and indeed usually does when a clot is forming, present a sensation more or less of a fluttering or at times of a halting character, or there may be an intermittence in the force of the beat; any of these with an insufficient radial fulness, should warn us to be on the alert. If there be this evidence upon palpation of the precordia, and at the same time coldness of the extremities or an unusual pallor which would denote anæmia, the case would certainly be a grave one, and if with this we had a series of symptoms which pointed to cerebral anæmia such as would be exemplified by those present in hydrocephaloid disease, though probably of milder form at the onset, our prognosis would be based accordingly, and the degree of gravity would be in proportion to the certainty of there being an organizing clot as shown by the physical signs, together with the character and persistency of the mechanical arrest of the circulation. Of course when a clot has firmly formed, and the backing of blood begins to take place throughout the pulmonary channel, the symptoms of pulmonary engorgement with œdema, of venous systemic congestion, would follow in suit, and a gradually weakening, fluttering heart with feeble impulse and muffled sounds, a feeble, irregular, and finally indistinguishable radial pulse, dilated pupils, darkened lips, and gasping breathing—all these would be signs only too evident and too late for treatment.

Left-sided heart clots are found no doubt in most cases where the heart's muscle has been weakened, and where the death agony has been prolonged, their appearances after death, the yellow colour of chicken-fat, with prolongations into the trabeculated network of the inner heart, with extensions into the auricle and finally into the vessels, show them to be formations not of the moment but anteceding death by a length of time

[1] See Article "Case of Heart-Clot, etc.," by Dr. A. V. Meigs, in vol. v., third series Trans. of College of Physicians of Phila., where, in all probability, a heart-clot existed fully *five* and a half days before death.

of which we have as yet no means of computing; especially is this the case with young children when the localization of cardiac murmurs in the febrile state is most difficult if not impossible. Occasionally in such cases the first notice we would have would be that of embolism; or possibly the miliary embolic infarction of distant organs would attract attention as a sort of metastatic complication only to be correctly interpreted by post-mortem examination.

In the right ventricle we find a condition which I believe is more common as a final complication, and which I feel sure if early detected could be averted by proper treatment in some cases.

Any of the factors mentioned, or a combination of all, which is probably found in most cases, is accountable for the large mortality in the acute febrile affections of early childhood. Frequently I have made post-mortem examinations of children and found the following state of affairs: a heart in systolic contraction, the left ventricle empty or probably lined with a thin layer of firm yellow clot only occupying the interstices of the network of the ventricle showing the inability from weakness of the muscle to completely empty the ventricle of its contents. The lungs partly healthy, with emphysematous edges, partly congested or inflamed, with portions œdematous or hypostatically congested and probably a general bronchitis, or some broncho-pneumonia, all, or any of these, showing the mechanical impediments that checked the flow from the right ventricle. The right ventricle would contain a large firm yellow clot, at times filling the entire ventricle to the utmost of its diastole, the portions first formed, and in contact with the heart's muscle firm and tough and difficult to detach, the last formed being dark like an ordinary clot; the ramifications extending into the auricle, at times into the cavæ, and in one case into the jugular and right lateral sinus of the cranium. Last spring I witnessed the distressing deaths of three children from the ages of eight to ten years of malignant scarlatina, their cases were much alike in the feature of thorough blood-poisoning with at first high fever, in one a convulsion, in one a mottled purplish eruption with the rapid development of very severe anginose symptoms accompanied by a dense large diphtheritic membrane, which finally totally obstructed breathing through the nasal passages. Although coma did not develop early, and the muscular strength did not seem very greatly impaired, the earliest sign of a fatal termination was the evidence of a forming heart clot. This consisted in an accelerated respiration, which may have been caused by the laryngeal obstruction, and the insufficient aëration causing a venous stasis or engorgement in the lungs, and finally a troubled irregular heart with gradually diminishing pulse beats and venous engorgement.

In 1877, I saw a case in hospital practice, of a man æt. 35, suffering in the early stages of diphtheria, who was unexpectedly found by the resident physician comatose, pulseless, and cold, with respirations ex-

ceedingly rapid, the heart beating with great rapidity and irregularity.[1] Post-mortem examination showed a clot which was white, hard, and very large, existing in the right ventricle, extending throughout the venæ cavæ, and finally into the venous system; there was also found one in the left heart, though smaller but of the same character, and it was continuous from the ramifications by the pulmonary vein, and extended through the aorta and its branches.

In September last I saw a case with my friend Dr. R. W. Deaver, of Germantown, of a child, who had for several days exhibited peculiar cardiac symptoms, in connection with an attack of capillary bronchitis. The child was about ten years old, she was in delicate health, her mother having died from phthisis. The lungs showed impaired percussion resonance, with no appreciable actual dulness; there was exaggerated puerile breathing, and fine moist râles of all kinds throughout the chest posteriorly. The child's muscular strength did not seem to be greatly impaired, as she was continually moving her position for a semi-prone position, and leaning forward endeavouring to get breath to relieve her from the threatened suffocation. Her veins were engorged, the lips bluish, the pupils dilated. The heart was beating almost too rapidly to be counted, with irregularity in force and frequency. A most careful examination of her chest showed that there was marked precordial bulging, with dulness on percussion seemingly twice what there should have been for a normal heart at her age. The apex beat was forcible, fluttering, and irregular, and as the whole heart seemed to impinge upon the chest wall, it was difficult to locate the spot where the apex itself was to be felt. There was marked beating below the ensiform cartilage, and the cardiac dulness extended fully one inch toward the right of the sternum. Of course it was impossible to correctly interpret the confused mass of sound heard upon auscultation so far as to detect abnormal murmurs. In this case heart clot was undoubtedly the cause of death, although no autopsy was made, and the initial cause of the disturbance must have been the inflamed lung, in the extensive bronchitis with catarrhal pneumonia, though certainly the sounds heard by auscultation were those of pulmonary œdema which was coming on from the intense engorgement.

These cases will simply show the train of symptoms as they arise in the progress of the disease. It is a condition which we cannot be too careful to watch for in diphtheria and scarlatina. In the former disease, not only on account of the tendency to coagulation of blood which it possesses in common with the latter, but also because of the mechanical obstruction from the membranes asphyxiating the patient, and thereby causing a stasis in the pulmonary current and venous backing upon the right heart; and also because the enlarged and firm lymphatic glands of the neck press

[1] In report of Philadelphia Pathological Society, vol. vii.

upon the jugulars and upon the pneumogastrics. In measles we have the tendency to an aggravated pulmonary catarrh, a bronchitis which on account of the vascular supply being identical may congest and finally inflame the inter-vascular tissue, and give rise to a diffused and extensive catarrhal pneumonia with vesicular collapse that may form an obstruction sufficient to gradually cause a clot to deposit.

If this subject be so important a one as my limited experience makes it appear to me, it certainly deserves most careful consideration from those whose opportunities would give them the means of study. For instance, if many cases of diphtheria die of heart clot, is it not absolutely essential for us to have this in mind during our treatment, so that whilst giving our attention to the throat deposit, we may also institute early enough such treatment as will tide the patient over the severity of the disease by avoiding the worst complication that could exist. It would not be enough to use local washes, antiseptic inhalations, stimulants, milk and beef-tea *alone*—they would not act with sufficient energy to be followed by a prompt alteration in the blood to prevent coagulation, or stimulation of the heart's action.

In such cases the early use of an alkali should be associated with the stimulating and supporting treatment. Carbonate of ammonium is probably the one upon which we can place the greatest reliance, but to get the full benefit from it we must use it from the commencement, and not expect it to resuscitate a case in articulo mortis. The usual recourse to this important drug when everything else has failed, has led us to regard it with doubtful efficacy—but as a preventative of heart clot, and not its cure, it is most valuable. Probably we have lately had another weapon given us which may prove most valuable in the salicylate of sodium; this should also be given in frequent and increasing doses from an early period in the disease. The endeavour to render the blood less liable to clot by the use of alkalies should be accompanied by a trial of drugs more directly acting upon the heart itself, to regulate and stimulate its action, and for this end we have a potent weapon in digitalis. Belladonna also possesses this power to a marked degree; it would probably be well to use it, or atropia, at the onset, and to withhold the digitalis till indications for its use arise later in the course of the disease. I believe we would find a valuable aid in the nitrite of amyl, given either by the mouth or by inhalation in cases where much systemic venous engorgement exists due to cardiac weakness where no pulmonary obstruction is present, it would doubtless help to restore the balance of the circulation, relieve the congested and burdened right heart, and thus act far more favourably than would digitalis in such cases, the latter tending to simply drive an overloaded heart without relieving it of its contents, and in the effort causing final exhaustion, and a fatal issue. Should there be marked pulmonary stasis from broncho-pneumonia, digitalis would again be contra-indicated. In such

cases the free use of alkalies, counter-irritation to the surface of the body, as friction, warm baths, mustard poultices, dry cupping, or local steaming, whatever in fact would tend to relieve pulmonary engorgement, would do far better than to force the cardiac muscle, itself weakened by granulo-fatty change, to drive its contents through capillaries that are already obstructed —clogged by inflammatory stasis. In such cases the free use of brandy associated with digitalis would surely be harmful, and in their stead our duty is to relieve the heart instead of driving it, by tonic stimulants, wines such as Burgundy or port, highly concentrated nourishment, fresh air and plenty of it, in fact sustain the patient, and coax the lungs to permit a freer passage of blood to the left heart. Quinia and strychnia, in small and frequent doses, would be of value in such cases. I would not give digitalis where extensive pulmonary complications exist during the height of the disease, but should a flagging heart demand its use in cases where the lung obstruction has yielded to other treatment, when there is no longer a mechanical impediment remaining, and the right heart is not overdistended, digitalis will be the drug to act as a tonic to the heart fibre, and with the aid of brandy, the compound tincture of cinchona, a small dose of the tincture of nux vomica, will keep the circulation, both venous and arterial, well balanced, and thus avoid, at least, the heart-clot from sluggish action.

If my supposition be correct that our treatment of these early childhood diseases is so often unsuccessful on account of the formation of the heart clot which will gradually grow into great importance, but which unfortunately at its onset gives no evidence of existence, the importance of studying the early signs of such a condition cannot be overestimated, and until certain symptoms or physical signs, pathognomonic in character, have been brought forward to warn us of our danger, the treatment calculated to obviate this tendency should be used at the onset of the disease; for as far as we know a heart clot once formed cannot be reabsorbed.

N. W. COR. 22d AND LOCUST STS.

ARTICLE XII.

SIMULTANEOUS LIGATION OF THE CAROTID AND SUBCLAVIAN ARTERIES FOR ANEURISM OF THE INNOMINATE. AUTOPSY TWENTY-ONE MONTHS AFTER THE OPERATION.

By LEWIS A. STIMSON, M.D., Surgeon to the Presbyterian and Bellevue Hospitals, N. Y., etc. etc.

IN the issue of this Journal for July, 1880, was published the account of an operation performed by me in January, 1880, for the relief of a patient affected with an aneurism of the innominate artery. The operation con-

sisted in the simultaneous ligation of the common carotid and of the subclavian in its third portion, and was followed by the gradual subsidence of the tumour and the relief of the symptoms. At the time of the operation the tumour rose an inch and a half above the clavicle and was three inches broad; three months afterwards its accessible portion was reduced to a small hard lump rising one-fourth of an inch above the clavicle just behind its inner end. It remained afterwards unchanged until the patient's death; but the pulsation was not expansive, and was evidently only the lifting of the solid tumour by the underlying aorta.

The patient worked irregularly during the following year, and drank quite steadily. He complained only of occasional dull pain in the clavicle, and of the coldness of the right hand and arm in winter. In May, 1881, he began to cough and to lose flesh and strength, and by the middle of the following July had become so weak and suffered so much from dyspnœa that I readmitted him to the hospital. He presented then the physical signs of pulmonary phthisis on the right side. His condition improved slightly for a month or two, and then the dyspnœa increased, the appetite was lost, and the strength failed steadily; he took to his bed about the 10th October, and died on the 20th, almost exactly twenty-one months after the operation.

The autopsical examination was limited to the chest. The lungs were first removed, both were large, firm, and gray in section, the whole of the right and more than half of the left being almost completely consolidated.

The right clavicle was divided in its middle third, the first right rib divided near the spine, and the heart, aorta, and tumour lifted out, together with the main vessels of the neck.

The aneurismal tumour was situated in front and to the right of the innominate, conical in form, its apex lying just behind the sternal end of the clavicle. Its height was two inches, the diameter of its base two and a quarter inches. After dividing the arch of the aorta longitudinally along its concavity the orifice of the innominate could be seen dilated to a diameter of one inch and a quarter, and through it could be seen the interior of the pouch completely filled by a firm pinkish clot. The aneurism arose from the anterior and right half of the artery, involving nearly its entire length; it began just above the origin and extended nearly to the spur of the bifurcation. A second incision was carried across the anterior aspect of the aorta to and up the anterior aspect of the innominate; it exposed a second small shallow aneurism in the tracheal side of the innominate about an inch in diameter, and half an inch in height; this also was filled by a firm clot. The clots of these two pouches were in contact with each other by their bases. They were laminated in structure, closely adherent to the wall of the sac, and covered on their free surface by a membrane that was structurally continuous with the wall of the artery, so that the blood could not make its way at any point between the clot and the wall of the sac.

The aneurism, or the artery, was pervious to this extent that blood could probably pass in a small stream between the contiguous bases of the two clots.

The carotid artery was completely occluded from its origin to its bifurcation by a pale adherent clot, which was also overgrown by a membrane at the origin of the vessel and at the bifurcation. The place where the

ligature (catgut) had been applied, one inch below the bifurcation, could be recognized by the touch as a transverse sulcus when the vessel was rolled between the fingers. There was no change at this point in the size of the artery. There was communication between the external and internal carotids at the bifurcation.

The subclavian artery was pervious in its first and second portions; its branches not recognizably dilated. It was entirely obliterated for a distance of half an inch in its third portion, its lumen was of full size on each side, the obliteration ending abruptly in a smooth rounded pouch. Apparently the artery had been completely divided by the ligature and its ends had separated by retraction. There was no clot on either side of the occluded part.

The common carotid was permanently occluded at the bifurcation by a white glistening membrane uniform in appearance and continuous with the inner coat of the artery.

The aorta was atheromatous, and slightly and irregularly dilated in its arch.

The heart was of normal size, the valves unaltered and sufficient.

The sternal end of the clavicle was thinned by absorption of half its thickness for an inch at its sternal end where it lay in contact with the apex of the aneurism.

The trachea presented just above its bifurcation a reddish, granular looking spot corresponding to the centre of the second shallow aneurismal sac.

ARTICLE XIII.

A CASE OF VESICO-VAGINAL FISTULA. By WALTER F. ATLEE, M.D., of Philadelphia.

THIS JOURNAL has among its original articles three of the most important, if not the three most important, contributions in surgical literature, to the cure of vesico-vaginal fistula. In the number for August, 1839, is the article of Hayward; in that for July, 1847, is that of Mettauer; and the number for January, 1852, contains the well-known article of J. Marion Sims. We know of no other beyond these of equal significance as pointing out for the first time what is needed to make successful the operation for the closure of the fistula, unless it be that of Gosset, contained in the *Lancet* for November 29, 1834.

In these articles are reported cases of complete cure of this once hopeless affection, with a detailed and reasoned account of the proper position of the patient in the operation, the necessary incisions to be made at the seat of lesion, the sutures to be used in closing the orifice, and of the after-treatment of the case.

Gosset placed his patient on her elbows and knees, vivified the edges of the fistula, made use of silver-gilt sutures, and left the patient on her face, with a gum catheter in the bladder. He says he reports his case

"to introduce to the notice of the profession the use of the gold wire, or rather silver-gilt wire suture."

Mettauer's patients were placed and confined precisely as in the operation of lithotomy; two pretty broad spatulæ were used to dilate the vagina; the denuded surface was eight lines in width, and embraced the salient free border of the fistula, as well as the margin exterior to it on the vaginal surface. The suture was of lead, "because it could be tightened," and was passed directly through the vesico-vaginal septum, so as to enter the bladder eight lines from the edge of the opening, and brought out in the same way on the opposite side. A short and exceedingly light tube of silver was introduced and held in the urethra. The ligatures were removed on the thirteenth day; the tube was used for four weeks.

Hayward placed his patients as in the operation for lithotomy. A bougie was passed through the urethra into the bladder, and then held so as to bring down and expose the fistulous opening. The whole circumference of the fistula was removed one line from the edge, and the membrane of the vagina was then dissected up from the bladder all around to the extent of three lines. This was done to increase the chance of reunion by having a larger surface, and also to prevent the carrying of the needles through the bladder. The needle was introduced one-third of an inch from the wound through the membrane of the vagina and the cellular membrane underneath, and brought out at the opposite side at about an equal distance. A catheter was left in for some days, and then introduced once or twice only every day for several weeks.

By dissecting up the membrane of the vagina *to a considerable extent around the orifice*, and carrying the needles through this membrane *at some distance from the edge of the wound*, Hayward made the most important improvement ever made in this operation. It is not a certain speculum, a peculiar position, the use of metallic sutures, and a self-retaining catheter, that make the operation successful; but it is this: that not only the edges of the fistula are vivified, but a raw surface is made to a considerable extent all around it, and that the opposite sides are then brought together over the fistulous orifice in such a way that the parts brought together are not left in the lowest part of the bladder, but the upper edge is pushed upward into the cavity of that organ. Position, sutures, specula, and ingeniously contrived instruments are of use only in proportion to their assisting in the carrying out of this principle. To vivify simply the edges of the fistula, parts so narrow and so inclined downwards that it is almost impossible to place them in such exact apposition as to prevent the urine filtering between the points of sutures, is so difficult that it did not succeed often, even in the hands of Jobert, whose dexterity I have witnessed, and believe to be unapproachable.

In the remarkable paper of Dr. Sims are described and figured in twenty-two wood-cuts many mechanical contrivances, "the slow work of

experiment," by which the surgeon is much assisted in the performance of this operation. He says: "The position of the patient for the operation, the speculum, the means of vivifying the edges of the fistulous opening, the suture apparatus, and the catheter, are, I believe, original with myself, having been suggested by the peculiarities of individual cases." All these things, although the invention of Dr. Sims for himself, were certainly suggested to the minds of others before his time, by the peculiarities of cases under their care, and brought to greater or less perfection in their practice, as can be seen in their communications to medical journals. He lays great stress upon a proper and free denudation of the fistulous orifice, and directs the sutures to be passed about one-half inch from the scarified edge of the fistule, pushed deeply into the vesical septum without transfixing it; brought out *just at the edge of the mucous lining of the bladder;* carried across the opening; made to enter the opposite side at a point corresponding with its direction anteriorly, observing the same precautions in its course, while it is brought out at the vaginal surface about half an inch beyond the scarified part. This figure (Fig. 1) is given in

Fig. 1.

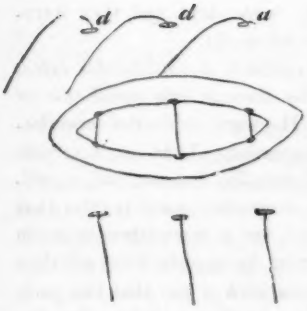
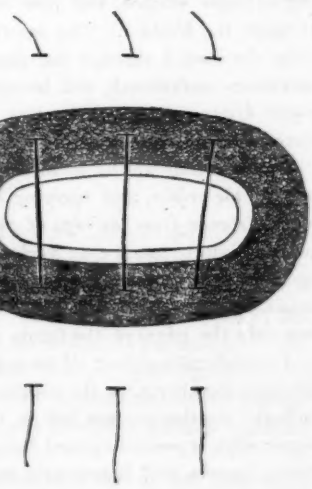


Fig. 2.



order to represent the situation of the sutures. For the purpose of vivifying the *edges of the fistule*, and of keeping these *edges* in contact, it is barely possible to improve upon the proceedings of Dr. Sims. A fistula can be cured, however, more certainly by carrying out more absolutely the principle first announced by Hayward.

If, in place of making the suture pass just at the edge of the mucous

lining of the bladder, it is made to pass at some distance from it, through a broad vivified surface made around the edge as is represented in Fig. 2, the connection with the bladder will be more certainly cut off, for there will be a contact of surfaces in place of edges, and there will be a crest projecting into the bladder in place of the depression in which the urine settles and finds its way along the sutures.

The history of the following case will show the correctness of these observations:—

Mrs. O'N., residing in Harmony Court, in this city, thirty years of age, tall, robust, and strongly built, was sent to me in October by her physician for relief, as a case of *fistula vesico-vaginalis*. She had been married for ten years; had six children, four of them still-born. With the first child she was two days and two nights in labour. After the birth of her fifth child she thought she had some kidney trouble, as her urine was always coming away, but she had never asked medical advice for this. In her sixth labour, August 17, the physician in attendance was astonished at the conduct of the opening in which his finger was passed, and which he never thought was other than the mouth of the womb. Fortunately passing the catheter into the bladder, the matter was explained to him. The patient was advised to wait for some weeks longer before submitting to an operation, and in the meanwhile to inject daily with water as hot as she could bear it. I operated upon this woman on the 1st of November, rather sooner after childbirth than is desirable when the choice of time is entirely our own. The perineum was torn to a considerable extent; the vagina was supple to the touch everywhere, and without scars or indurations; the mucous membrane was red, but without trace of ulceration; there was no excoriation externally; the fistula was situated in front of the neck of the womb, and seemed to be widest there. The extent of the opening was such that the first phalanx of my forefinger was surrounded by it; almost an inch in length, and three-eighths in width, the length being in the direction of the longitudinal axis of the vagina. The patient was full of courage, and willing to submit to anything so as to be freed from her disgusting infirmity.

The patient, having been previously prepared for the operation, as usual, by a purge, an enema, and strict diet, was placed on her back on a table, the knees drawn up against the belly, and the buttocks elevated by a hard, round bundle of bed clothing placed beneath them. This position is the most convenient one for these operations, unless the fistula be very near to the pubis, as the anæsthetic is more readily given; the blood does not flow into the bladder, and the fistula is not dragged further away. When the buttocks are well raised the upper wall of the vagina presents itself to the surgeon vertically or obliquely, rather than horizontally, and his operation is rendered thereby much easier. A small and very convenient lamp, invented by Collin, the successor of Charrière, was used to afford the necessary light. Sims's speculum was used to pull down the posterior wall of the vagina. There was little difficulty, using the ordinary instruments, in making the necessary *avivement*, which, as said above, was not on the edge of the fistula; but all around it, to a distance of one-third inch from this edge. Owing to the shape of the fistula, the sutures were passed from side to side, and in the manner above described. Five sutures, of silver wire, were used; the two sutures nearest to the womb were shotted, the other three were twisted and cut off.

After the operation nothing more was done than to regulate diet, to keep the patient on her back for ten days, and to keep the bowels quiet. No catheter was ever introduced, and she was allowed to urinate whenever and as she pleased. At the present day—November 23d—she goes about at her work perfectly well. The sutures are left, as they can do no harm, to the fistula at least, and the woman is strongly opposed to having them taken away.

By great skill in manipulation, by using most admirably contrived instruments, and by attention to minute details of treatment, these fistulæ can be cured by paring the *edges* and holding them together; but it is far easier to cure them by doing as I have done, and carry out, with the aid of more recently invented instruments, the great principle fairly laid down by Hayward in this JOURNAL: "*Dissect up the membrane of the vagina to a considerable extent around the orifice, and carry the needles through this at some distance from the edge of the wound.*"

ARTICLE XIV.

A CASE OF PULSATING TUMOUR OF THE HEAD OF THE TIBIA, TREATED SUCCESSFULLY BY COMPRESSING THE FEMORAL ARTERY; SUBSEQUENT AMPUTATION THROUGH THE CONDYLES OF THE FEMUR. RECOVERY.

By J. D. SMITH, M.D., of Friendship, Crockett Co., Tenn.

I WAS called Aug. 19, 1880, in consultation, to see D. A. W., æt. 24, and graduate of the Medical Department of the University of Nashville, and obtained the following history. Some nine or ten years ago patient discovered a tender spot about half an inch in diameter just to the right of the lower portion of the tubercle of the tibia of the left leg, which soon became painful and was attended with swelling of contiguous soft parts. This was treated by rest and liniments and the patient was soon on his feet again. But the tender spot remained. The next four or five years were spent in the active duties of farm life and of school, followed by one year's service as clerk in a dry-goods store and subsequently reading medicine and attending medical lectures, graduation, etc. During all this time the tender spot remained, but gave no particular inconvenience until the spring of 1880, after the patient was through with his medical course and commenced the active duties of a country practitioner, when it began to be painful, and upon examination was found to be slightly protuberant. In a short time the little tumour began to pulsate slightly; but the patient, encouraged by flattering prospects in his profession, and ambitious to succeed, disregarded the early warnings of what was soon to become a serious malady, and continued to perform his arduous professional labours until about August 10th, when a severe attack of rheumatic fever supervened and prostrated him.

It was after this attack of rheumatic fever had existed for nine days that I was called in consultation with Dr. T. J. Rice, to diagnosticate the tumour under consideration. The patient was found with the usual symptoms of one convalescing from an attack of rheumatic fever including

slight cardiac complications and with a painful, pulsating tumour of oval shape, on inner anterior aspect of the head of the tibia of the left leg about one inch in length, three-quarters in width, and half an inch elevation in centre. Compression of the femoral artery caused the tumour, together with the pulsation, to disappear, and left an excavation in the bone into which the point of the thumb could be thrust. Removal of pressure from the femoral artery was immediately followed by return of the pulsating tumour.

Aneurism of the head of the tibia was diagnosticated. The skin and periosteum over the tumour were supported by light pressure with a gum-elastic bandage, a general anti-rheumatic course of treatment was prescribed, and one of Briddon's double-artery compressors was sent for.

The Briddon compressor not being obtainable in New York, Skey's compressor was substituted, and on the 10th day of September, the rheumatic fever having given place to a slight irritable fever the result of constitutional disturbance, compression of the femoral artery was commenced and perseveringly kept up until the circulation through it was entirely obliterated. At the time compression was commenced the tumour had increased to double its size one month previously, the skin over it was red and dusky, and the surrounding soft parts considerably œdematous. Soon after compression was commenced the tumour disappeared, the pulsation ceased, and the œdema rapidly subsided. Compression was made with the instrument at three different points, the instrument being changed from one point to another so as to avoid long-continued pressure at any one place; but for the want of an efficient nurse to attend to the instrument it took five days to completely occlude the artery, and as a result there was some sloughing of the integument. During compression the patient was kept partially narcotized by hypodermic use of morphia, and during the entire treatment a roller bandage was applied from the toes up to the perineum.

The appearance of the site of the tumour after compression was more that of an excavation than a tumour; and the part was free from pain or uneasiness until about the fourteenth day after compression had been commenced when there were stinging, darting pains similar to those felt after the first week or ten days in fractured bone. These continued ten or twelve days, after which a perfect respite was obtained from unpleasant sensations in the diseased part for about one week, when, on Oct. 12th, pain of a heavy aching character began to be felt, and on the 18th slight pulsation could again be detected. During this time the general condition of the patient had greatly improved, the pulse had dropped from 105 to 90, the appetite had changed from an aversion to all food to a smart relish for a pretty good variety, irritative fever and all rheumatic complications had subsided, and strength sufficient to move about in bed and sit propped up had returned.

But with returning pulsation at the seat of the tumour all hope of success from compression vanished, and the favourable moment for the more decisive measure of amputation was seized upon. Hence, on the 23d of October, in the presence and by the kind assistance of Drs. Rice, Phillips, York, Osborne, Griffin, Bettis, and Fielden, I performed amputation at the knee-joint, sawing off the condyles of the femur at the junction of the articular cartilage and periosteum. Being anxious to preserve the patella, but unwilling to include within the body of the anterior flap the diseased integument covering the tumour, I attempted to modify Pancoast's opera-

tion by making a *short* anterior semilunar flap, including in its margin a portion of the integument overlying the tumour, and then cutting two long posterior lateral flaps. But I found that there was not sufficient integument to cover the stump well with the patella in position, and, fearing still further loss by the sloughing of that part of the anterior flap taken from over the tumour, I removed the patella, sawed off the condyles square with the line of the shaft of the femur, curtailed the length of the posterior lateral flaps, and completed the operation accordingly. The collateral circulation having been fully established, the popliteal together with four smaller vessels were ligated. The operation was performed, and the stump dressed, antiseptically. Union by the first intention, except a small space where the flaps came together, was obtained; and no untoward symptom occurred until on the evening of the thirteenth day after the operation the patient felt something suddenly give way in the end of the stump, and immediately the blood began to run back from under the antiseptic dressing. The nurse, who had been instructed in the art of compressing the external iliac where it passes from under Poupart's ligament, immediately compressed the artery, and together with other assistants controlled the hemorrhage until I was hunted up in a distant neighbourhood, and reached the patient at midnight. With the assistance of Drs. Rice, York, and Fielden, I divided the union between the two posterior lateral flaps, extended the incision back through the sound skin about 1½ inches, exposed the bleeding popliteal artery, and ligated it about one inch above its bleeding extremity.

Upon exposing the popliteal vessel, it was found that the external articular branch was given off about three-quarters of an inch above where it had been tied, and had been sufficient to keep the channel open and to prevent the formation of the necessary clot or plug. From this time on the patient made a good recovery.

Appearance of the Bone after removal.—On the inner anterior aspect of the head of the tibia, with the centre corresponding to the lower part of the tubercle, was an oval opening one-quarter inch in length and three-quarters inch in width. Just opposite this, on the outer anterior aspect, was another opening about two lines in diameter, and under the centre of the external semilunar fibro-cartilage was a third of about the same size. The entire head of the bone was a mere perforated shell with the thickest part posteriorly, where it was about one-eighth of an inch in thickness. From this part of the shell projected into the cavity, about half-way across its antero-posterior diameter, a burr-like portion of cancellated bony structure which crumbled down on the slightest pressure. The periosteum over the large opening was considerably ecchymosed, and beneath it was a thin layer of clotted blood. Beneath this, and filling the entire cavity of the head of the bone, was a pale, thick, jelly-like substance, a little granular to the feel when rubbed between the thumb and finger, and resembling very much the exudation thrown out between the unadjusted ends of a fractured bone. The bone in the immediate vicinity of the cavity was normal, except that it was a little increased in outline, with prominences less sharply marked than natural, and a little more porous. The knee-joint, notwithstanding that the external articular surface of the tibia was perforated, was in a normal condition.

Remarks.—If the disease is situated in the head of the tibia—its most frequent seat—and is recognized and treated by compressing the femoral artery in its early stage, I think there is some prospect of a cure without

amputation. The foregoing described case does not come under this head. It was in an advanced stage before it was diagnosed, and considerably more advanced before compression could be resorted to, and the writer had the merest shadow of a hope that compression might possibly result in a cure.

But the case was a very unfavourable one for amputation. The general condition of the patient was not likely to be worsted by delaying the operation, if the progress of the local disease and the constitutional irritation dependent thereon could be arrested. Compression of the main artery of the limb offered the only means of accomplishing this end, and held out some little hope that a cure might be effected. The result showed the wisdom of the course adopted. After the immediate constitutional effects of compression passed off, the general condition of the patient rapidly improved; the local irritation at the seat of disease passed off about as it would have done after an ordinary fracture; the slight pain and irritation attending the process of throwing out bony plasma to fill the cavity during the second and third weeks after compression were not greater than usually attends this stage of a well-adjusted fractured bone, and produced no constitutional disturbance; and when after the collateral circulation had become fully established, and pain and returning pulsation could be again felt in the tumour, the patient was in a fair condition for amputation. Besides, the filling of the cavity with bony plasma shows that, if the nature of the disease had been recognized in the early stage, and compression of the femoral artery resorted to, there would have been a fair prospect of a cure by the transformation of the plasma into bone, thus filling up and consolidating the part involved. If this treatment should fail, amputation could still be resorted to as in the above case. In the flat bones, where arterial compression cannot be resorted to, it seems to me that the trephine, Hey's saw, the gouge, and bone forceps should be early resorted to. The disease left to itself is inevitably fatal. If the limits of altered bone-structure can be included within the crown of a large trephine, or removed by more extensive instrumental interference without immediate fatal results, it offers the sufferer some hope for his life, and the operation is certainly as justifiable as many of the major operations of surgery now being performed. If such a case should present itself, I should certainly—after apprising the patient and friends of the gravity of the disease, as well as the dangers of the operation—not hesitate to attack the diseased part if I thought that the chances of surviving the immediate effects of the operation were equal with those of succumbing.

Before closing it might be well to allude to the secondary hemorrhage which occurred on the thirteenth day after the above detailed operation, and to draw a practical inference from the circumstances attending it. The superior articular branches are given off at a point nearly opposite

the junction of the condyles with the femur. They are rather circumflex in their course, and have branches supplying structures entirely above the seat of operation. Hence, if the popliteal is ligated just below the point of their origin, they are liable, as in the above case, to afford a channel through which sufficient blood may flow to prevent the formation of the clot necessary to the occlusion of the artery. In the above case, however, I think that the danger from this source was considerably increased by the free collateral circulation consequent upon the previous obliteration of the femoral artery. But in another amputation through the femoral condyles, I should certainly bear in mind this source of secondary hemorrhage, and try to ligate the popliteal above the point of origin of the articular arteries.

ARTICLE XV.

SOME RARE AND NEW ANOMALIES IN MAN: WITH THREE CASES OF DOUBLE FEMORAL ARTERY. By HOWARD A. KELLY, of Philadelphia.

MY notes taken in the dissecting-room for four years have repeatedly illustrated the observation, commonly made as to rarities of all kinds, that they never come singly, as the following four cases of supra-scapular artery arising from the axillary, three cases of double femoral, and numerous others in my note-book, will show.

Supra-scapular Artery coming from the First Part of the Axillary.—In about three hundred arms I have found this rare anomaly four times, occurring then on both sides of two white male subjects, in the dissecting-room of the Jefferson Medical College of this city. Both cases were observed within one week, and in each there were differences and details of arrangement of special interest, hitherto unnoticed.

CASE I. White man, slight, of moderate muscular development. Right arm, subclavian artery large, pierces the scalenus anticus muscle. Transversalis colli comes off the third part, and passes between the cords of the brachial plexus to its usual distribution. One-half inch below the border of the first rib, a large supra-scapular artery comes off the convexity of the axillary; it then passes back under what is left of the cord of the fifth and sixth cervical nerves, after they have formed the musculo-spiral, and joining the supra-scapular nerve, from the plexus two inches higher up, passes with it under the transverse ligament, the nerve *beneath* the artery. The artery gives off two branches to the sub-scapularis muscle, about one-half inch before reaching the ligament. On the left side this artery came off the axillary one-quarter of an inch below the border of the first rib, and, *mutatis mutandis*, was distributed *precisely* as its fellow.

CASE II. A white man, of moderate size and development. In the left arm the transversalis colli came from the third part of the subclavian, and was distributed as before, and one-quarter inch below the lower border of

the first rib, from the convexity of the axillary, arose the supra-scapular, whose course, distribution, and relations were precisely those of Case I. The right arm was similar, with the exception of there being no muscular branch to the subscapularis muscle, and the presence of a large branch to the trapezius muscle.

In five hundred and six cases Quain saw this anomaly occurring twice on the same subject, and his picture of the right arm shows the artery giving off two muscular branches to the subscapularis muscle, and passing under the transverse ligament. The nerves are not figured.[1]

The other reference I have found is J. Bankart *et al.*, *Guy's Hosp. Rep.*, xiv., 3d Ser., 1869, p. 446, which is, in full, "the supra-scapular was in one case observed to arise from the first portion of the axillary."

I believe that these are the only cases recorded, making, with my own, seven in all.

In hunting for this anomaly I have been several times misled by a similar branch arising from the axillary, just below the first rib, but which upon further dissection was found to terminate in the subscapularis muscle.

The Middle Sacral Artery arising from the Bifurcation of a Common Trunk of the Fourth Lumbar Arteries.—I have seen this anomaly twice in the dissecting rooms of the University of Pennsylvania.

In the first case, in a white man, the right and left lumbars came off a common trunk, one-quarter of an inch long, from the posterior surface of the aorta, and one-half inch above its division into the common iliacs; and from the bifurcation of these lumbars, as ordinarily from the aorta, arose the middle sacral artery, which, after passing to the left around the promontory of the sacrum, resumed its normal position opposite to the second sacral body. In the second case, in a negress, there were five common trunks for as many right and left lumbar arteries, and from the fifth arose the middle sacral, as in the first instance; but it then passed straight on down in the median line as normally.

According to Krause, in *Henle's Handbuch der Gefässlehre*, the following from Theile sums up all the anomalous relations described as existing between the median sacral and last lumbar arteries. *Encyclop Anat.*, tome iii.; *Traité de Myol. et d'Angéiol.* par F. G. Theile: trad. par Jourdan, Paris, 1843, pp. 528–29.

"*Middle Sacral Artery.*—It may originate in common with the last aortic lumbar, or, as I saw in one case, both of the last lumbars, from the two sides, and make a common trunk, from the left branch of which originates the middle sacral; or (according to Haller) sometimes even from the right branch."

Anomalous Pronator Radii Teres.—In a well-developed left forearm, of a white man, the palmaris longus was observed to be absent, and the pronator radii teres to arise by a head from the inner condyle, by a coronoid head, between which and the first passes the median nerve, and by a flat tendinous head, from the coronoid process lower down, which passes beneath the ulnar artery, to join the rest of the muscle near its insertion.

[1] Quain, Plate xxiv., fig. 7.

Prof. Macalister has observed this once (Catalogue of the principal muscular anomalies hitherto published [1871]. *Irish Acad. Trans.*, xxv. 1872, p. 84.

"A double coronoid head, the second lying posterior to the artery: this I met with in 1868. Mr. Kelly has informed me that he met with another instance of this in 1870, both heads lying posterior to the median nerve."

Double Femoral Artery.—The rarity, and yet the practical importance, of this anomaly is well known to every surgeon. My notes furnish three cases.

CASE I. was in the right leg of a white male subject, dissected by Dr. Crozer Griffith, at the University of Pennsylvania. The profunda came off about normally, and about four and a half inches below Poupart's ligament; the femoral artery divided into two slightly unequal branches, the inner being the larger, and these, diverging somewhat, reunited just above the canal in the adductor magnus, forming an islet of about three and a half inches in length. The anastomotica magna came off just below the point of union.

CASE II. (see figure) occurred in the dissecting-room of the Jefferson

Double femoral artery.

Medical College, this winter, in the right leg of a slight and poorly developed white woman. A femoral artery of normal size gave off from its outer side, two inches below Poupart's ligament, the profunda, which hugged close to its side, and divided into its usual branches. One-half inch below the profunda, and two and a half below Poupart's ligament, the femoral artery divided into two equal branches, which then continued close together down the thigh, in the proper position of the single artery, and reunited seven and three-eighths inches below, just above the canal in the adductor magnus. The anastomotica magna was given off immediately below the point of reunion.

Another case, which I have not yet examined personally, I have the privilege of reporting through the kindness of Dr. J. Ewing Mears:—

CASE III. A white man, of about twenty-five years of age, was admitted to the St. Mary's Hospital early in August last, for punctured wound of the thigh, involving the femoral artery. On account of the hemorrhage Dr. Mears cut down on the artery, and ligated the proximal end in the afternoon. Late that same night a violent secondary hemorrhage occurred, when the wound was opened and packed, and at last Monsell's solution used. The man died some days afterwards as a result of subsequent hemorrhages, purulent discharges, and hectic. Dr. Mears being absent from the city at the time, the resident physician examined the condition of the arteries,

above the ligature, and found the profunda coming off above Poupart's ligament, and immediately below, the femoral dividing into two equal branches, in separate compartments, one lying more superficial than the other; it was this outer branch which had been ligated. I cannot say whether they reunited, as usual, as I have not yet had the opportunity of dissecting the lower part of the limb, which has been preserved intact.

I find references to the following seven cases of this remarkable anomaly: 1st. Ch. Bell, *Lond. Med. and Phys. Journ.*, vol. vi. 1826. *Dublin Hosp. Rep.*, 1827, iv. 2d. Huston, *Dublin Hosp. Rep.*, 1827, iv. 314. 3d. Tyrrell's case in *Quain*, 1844, p. 515. 4th. *Quain*, 1844, Plate lxxi., fig. 2. 5th. Tiedemann, 1846, taf. li., fig. 1, oder fig. 2 der Explicat. 6th. Tiedemann, 1846. Explicat, p. 108. 7th. Chrétien, *Mém. Soc. de Méd. de Nancy*, 1880, pp. liii.–lx. Chrétien's paper I have not yet seen.

Of great interest in this connection is the following extract from Casamayor's *Essai sur l'Artère fémorale*, Juilliet, 1825. *Thèses de l'École de Médecine*, Paris, 1825, 5, p. 42, written before any case had been recorded :—

"As the brachial artery sometimes divides close to the axilla, into radial and ulnar, it has been judged that the same would occur in the femoral, that it would divide sometimes close to the groin into two trunks, which from thence would pass down together to the upper part of the leg."

He then explains that the observations of Heister and Gooch, that they had seen it when amputating, were worthless, not being based upon dissections, and, probably, being nothing more than a strongly developed profunda. Bell's case, the first of which any published description was given, was as follows :—

"A negro, admitted to the Middlesex Hospital for aneurism of the popliteal artery of the left leg." Mr. Bell tied the femoral artery low down. "The pulsation of the tumour ceased for a few seconds, but soon returned nearly as distinct as before the operation." The patient died on the sixth day from erysipelatous inflammation of the wound; "on dissection it was found just below the part where the profunda was given off, that the femoral artery was divided into two nearly equal branches; these ran parallel to each other to the part where the artery passes through the triceps muscle; here they reunited. The ligature was found on the more superficial artery, a little above this reunion."

A practical point of value in this case was the observation, made by Mr. Bell previous to operation, that pressure high up completely controlled the pulsation, while pressure low down did not. The anomaly here was not the cause of death, while it certainly caused the fatal issue in Dr. Mears's patient, as above reported.

Huston's case occurred in the left femoral artery of "an elderly woman." The profunda came off an inch and a half below Poupart's ligament, and passed directly back of the femoral artery. About one-half inch below the profunda, the femoral divided into two branches, the external being somewhat the larger; these lay together in the same plane, and reunited at the opening in the triceps. The inner of these branches gave off a small muscular branch, and the outer two

muscular branches and the anastomotica magna. The third case, that of Tyrrell, is merely mentioned by Quain, 1844, p. 515, as occurring in a mature fœtus.

The fourth case is figured, life-size, by Quain. In the right leg the profunda comes off one inch and a half below Poupart's ligament, and about one and three-eighths inches below the profunda the femoral bifurcates, forming an islet five and three-fourths inches long. Two muscular branches come off the outer trunk.

Through the kindness of Prof. Tiedemann's son, Dr. Tiedemann, of this city, I have consulted his plate of the fifth case, in the left leg of a man of forty.

The profunda comes off two inches below Poupart's ligament, and immediately below this the femoral divides into two trunks equal in size, which, after running close together, reunite six and a half inches below. The inner gives off two muscular branches.

How Henle (*Handb. der Gefäss.*, 2d Auf. 1876, s. 311) includes this with the fourth case, figured by Quain, I cannot imagine, as they are on different legs, and differ in their measurements and muscular branches.

I extract the following brief notice of the sixth case from Tiedemann, 1846, explic., p. 109; after describing the last, which is figured life-size, he says: "I saw a similar case in the Museum of Pathological Anatomy of St. Bartholomew's in London." Can this be Quain's case?

The case recorded by Ducachet (*Amer. Med. Times*, March, 1863) is so imperfectly described that it is impossible to say positively in what category it belongs.

In amputation (he does not state at what place) for a shell wound of the knee, two arteries were seen beating in the flap about two inches apart. Upon a post-mortem examination the profunda was found as usual, and the femoral divided below Poupart's ligament. It is not known whether these branches reunited, and, in their wide separation of two inches, as seen in the flap, they differ from all the other recorded cases.

The seven cases above referred to, with the descriptions of my own three cases, make ten in all observed and recorded up to the present time.

REVIEWS.

ART. XVI.—*Review on Hypnotism.*

1. *Neurypnology; or the Rationale of Nervous Sleep, considered in Relation with Animal Magnetism. Illustrated by numerous cases of its successful application in the relief and cure of disease.* By JAMES BRAID, M.R.C.S.E., C.M.W.S., etc. London: John Churchill, 1843.
2. *Nouveau Dictionnaire de Médecine et de Chirurgie Pratique.* Art. *Hypnotisme*, par MATHIAS DUVAL. Paris: Libraire, J. B. Baillière et Fils, 1874.
3. *Animal Magnetism. Physiological Observations.* By RUDOLF HEIDENHAIN, Professor of Physiology in the University of Breslau. *Translated from the Fourth German Edition* by L. C. WOOLDRIDGE, B.Sc., London. *With a Preface* by G. J. ROMANES, M.A., F.R.S. London: C. Kegan Paul & Co., 1880.
4. *Études Cliniques sur l'Hystéro-Épilepsie, ou Grande Hystérie.* Par le Dr. PAUL RICHER. *Précédé d'une Lettre-Préface* de M. le Professeur J. M. CHARCOT. Paris, 1881. *Chapitres* V., VI., VII., et VIII., *sur Hypnotisme—Catalepsie, Léthargie, et Somnambulisme Hystériques Provoqués.*
5. *Contribution a l'étude de l'Hypnotisme chez les Hystériques; du phénoméne de l'Hypérexcitabilité Neuro-musculaire.* Par Mm. CHARCOT et PAUL RICHER. Archives de Neurologie, Nos. 5, 6, Juillet et Octobre, 1881.
6. *Hypnotism in Animals.* By Professor JOSEPH CZERMAK. *Translated from the German* by CLARA HAMMOND. *Popular Science Monthly* for September and November, 1873.

THREE epochs stand out prominently in the history of hypnotism: in the first we see the striking but grotesque figure of Mesmer, who, about the year 1772, announced his supposed great discovery of a universal magnetic fluid; the second was ushered in by Braid, whose investigations were begun in 1841; we are now passing through the third, which has been given a real scientific basis by the labours of Heidenhain and of Charcot and his school.

The story of Mesmer is a familiar one to all students of science. The immense sensation created by his performances can scarcely be credited in our own more stolid times. The French Government appointed a Scientific Commission, which was headed by Franklin, to investigate his wonderful pretensions. The committee of the medical section of the British Association, in 1842, declined receiving Braid's first communication on hypnotism. He, however, read his paper, and gave a public exhibition, which was attended by many members of the Association.

Braid was the author of several works upon hypnotism and allied subjects, and these are about to be, or perhaps by this time have been, published again in collected form. The work named above, of which we have a copy before us, dates back, however, to 1843. It embodies his most

important researches and hypotheses up to the period of its publication. His remarks in refutation of materialism and against the idea of the supposed tendency of studies in phrenology and hypnotism in this direction, would probably seem, both to the theologian and scientist of to-day, a work of supererogation. Inserting records of cases attested by patients and their friends would hardly at present be considered convincing or even allowable; but Braid gives as his reason for so doing that most unwarranted interferences were resorted to by several medical men, in order to misrepresent some of these cases.

Although, as Mr. Romanes points out, Braid anticipated Heidenhain in many, if not in most, of his observations, the latter scarcely alludes to the work of his predecessor. It is probable, as suggested, that Heidenhain was only acquainted with Braid's investigations from hearsay, and therefore that the two researches, in so far as they are common, have been independent.

In this review we propose to take a general survey of our subject, and to study especially the views of Heidenhain and of Richer. Duval's article in the *Dictionnaire de Médecine et de Chirurgie Pratiques*, to which we have gone for some facts, is a clear, condensed, and, in most respects, highly satisfactory exposition of the entire subject of hypnotism. It is accompanied by an extensive bibliography, which will be found of great value to investigators.

Recent French investigations into the subject of hypnotism have been chiefly in the domain of hysteria. It is interesting to note and compare these with the results achieved by Heidenhain and his coadjutor, mainly upon educated individuals in good health and of acknowledged reliability. The medical profession owes a new debt of gratitude to Charcot and his associates at La Salpêtrière for their researches. Towards the end of 1878 Charcot made some interesting researches on hypnotism, which were the subject of several clinical conferences at his hospital, and of which a report appeared in several journals. (*Progrès Médical*, No. 51, 1878; *Gazette des Hôpitaux*, 21 Nov. et 5 Déc. 1878; *Gazette Médicale de Paris*, Nos. 46, 47, et 48, 1878.) The following year the same facts held an important place in the inaugural thesis of Richer (*Étude descriptive de la grande attaque hystérique et de ses principales variétés*, 1879), and later in his work on Hystero-epilepsy. Regnard, who contributed to the first researches of Charcot in 1878, afterwards issued several publications on this subject. (*Revue Scientifique*, No. 13, 1881; *Sommeil et somnambulisme*, conférence faite à la Sorbonne.) Regnard, in collaboration with Bourneville, published the third volume of the *Iconographie photographique de la Salpêtrière* (1879–1880), devoted for the most part to a study of hypnotism, some extracts from which have appeared in *Le Progrès Médical*, Nos. 14 et 15, 1881; and in *la Nature*, 1881. We have made use of some of the interesting historical and other facts in these publications of Bourneville and Regnard. At the epoch of the appearance of the first works from the Salpêtrière, the only recent publication on the subject was a memoir of M. Ch. Richet. (*Du Somnambulisme Provoqué*, Robin's *Journal de l'Anatomie et de la Physiologie*, 1875.) Before this epoch, Charcot and Richer cite the works of Pau de Saint-Martin (1869), of Baillif (1868), of Lasègue (1865), of Mesnet (1860), of Demarquay and Giraud-Teulon (1868), of Azam (1860), and of Broca (1859).

Hypnotism has a history beyond that which is recorded in the plain annals of science. We see physicians, say Bourneville and Regnard,

holding conversations and diagnosticating diseases that never existed even by name; and we find hysterical persons predicting their crises, which naturally occurred at the hour appointed, and which were taken by observers for terrible maladies! Vasseur-Lombard gives a method of curing cancer by magnetism. The same magnetizer treats sick animals and even diseased plants by magnetization. What has been called contemplative asceticism has always been produced by the prolonged fixation of the gaze on some object, brilliant or not, but to which some virtue was attached, and which was supposed to possess some sanctity. These contemplations, aided by a violent intellectual excitation, were rapidly followed by hallucinations, apparitions, and even a state of ecstasy, such as is described both in thaumaturgy and medicine. The books of the Christian hagiographa abound in facts of this kind. In India the devotees arrived at similar results by gazing into space; sometimes they looked at an imaginary point, often also at the end of the nose.

The historian, Gibbon, in the *Decline and Fall*, gives the story of the monks of Mount Athos, referred to by Duval, and by Bourneville and Regnard:—

"The Fakirs of India and the monks of the Oriental Church were alike persuaded that in total abstraction of the mind and body, the purer spirit may ascend to the enjoyment and vision of the Deity. The opinions and practices of the monasteries of Mount Athos will be best represented in the words of an abbot who flourished in the eleventh century: 'When thou art alone in thy cell,' says the ascetic teacher, 'shut thy door and seat thyself in a corner: raise thy mind above all things vain and transitory; recline thy beard and chin on thy breast; turn thine eyes and thy thoughts towards the middle of thy belly, the region of thy navel; and search the place of the heart, and the seat of the soul. At first all will be dark and comfortless; but if you persevere day and night you will feel an ineffable joy; and no sooner has the soul discovered the place of the heart, than it is involved in a mystic and ethereal light.'

"This light, the production of a distempered fancy, the creature of an empty stomach and an empty brain, was adored by the Quietists as the pure and perfect essence of God himself; and as long as the folly was confined to Mount Athos, the simple solitaries were not inquisitive how the divine essence could be a *material* substance, or how an *immaterial* substance could be perceived by the eyes of the body. But in the reign of the younger Andronicus these monasteries were visited by Barlaam, a Calabrian monk, who was equally skilled in philosophy and theology. The indiscretion of an ascetic revealed to the curious traveller the secrets of mental prayer, and Barlaam embraced the opportunity of ridiculing the Quietists who placed the soul in the navel; of accusing the monks of Mount Athos of heresy and blasphemy. His attack compelled the more learned to renounce or dissemble the simple devotion of their brethren; and Gregory Palamas introduced a scholastic distinction between the essence and operation of God."

The Egyptians induced clairvoyance in boys by causing them to gaze on a pool of ink in the palm of the hand. In a foot-note, Heidenhain states that, according to a communication from Mr. Rossi (physician to Halein, Viceroy of Egypt), Mm. Giraud-Teulon and Demarquay, Egyptian conjurors have hypnotized for many centuries, by making their media stare at cabalistic marks on glistening porcelain plates, or at a glittering crystal ball.

Islamism has given birth to several special methods of hypnotization. A prolonged and monotonous sound has a more prominent place than contemplation in these processes. Among the disciples of Hussein, the martyr, trance or ecstasy is brought on by means of timbrels ceaselessly beaten with the same rapid and monotonous cadence. Some of the initi-

ated accompany with a chant, timed to the sound of the timbrels. The ceremony often takes place at night, and soon the adepts fall into a sort of ecstasy, in which cutaneous insensibility is so extreme, that it is possible to reproduce in them the different phases of the martyrdom of the master, without calling forth from them a cry, and without their even seeming to know anything about what is being done. It is, however, in the sect of Aissaoua, of which many representatives are still met with in Algiers, that these phenomena are exhibited with the greatest intensity. Those who have, by rare chance, assisted at one of their ceremonies must have been struck with the degree of anæsthesia with which these men are affected.

The scene is at night, in some solitary plain; the monotonous noise of the timbrels is heard. The adepts are seated around a large fire. Little by little they fall into a trance; some even are seized with convulsions and give forth prolonged cries. Anæsthesia becomes complete, and some are seen to apply their tongues to a bar of red-hot iron, while others, covered with blood, chew Barbary figs, the long spines of which pierce their cheeks through and through. Some swallow living spiders and scorpions —a proceeding which may be followed by grave accidents. (Bourneville and Regnard.)

Before analyzing the investigations of Heidenhain, Charcot and Richer, and Czermak, we will describe some of the so-called "methods" of mesmerizing or hypnotizing. We will also consider briefly the procedures for awaking individuals from the hypnotic state, and some of the dangers that may attend experiments in hypnotism.

Bourneville and Regnard quote from Teste methods employed by several distinguished "magnetizers," some of which we will give. Deleuze's directions, somewhat abbreviated and changed in wording, were as follows:—

> Remove from the patient's presence everybody who might incommode you. Take precautions not to be interrupted during the sitting. Seat him comfortably, and place yourself opposite and a little higher than he is, and so that his knees and feet shall be between yours. Ask that he give himself up entirely. Take his thumbs between your two fingers, so that the insides of your thumbs and his touch. Fix your gaze upon him. Remain thus from two to five minutes. Next take away your hands, extending them towards the right and left, palms outward, and then lift them up as far as the head. Place them on his two shoulders, leaving them there about a minute; afterwards draw them down along his arms to the ends of his fingers, touching lightly. Repeat this pass five or six times, always turning your hands, and sweeping them off a little before reascending. Next place your hands above the head, hold them there a moment, and bring them down before the face at the distance of one or two inches, as far as the pit of the stomach, there let them remain about two minutes, passing the thumb along the pit of the stomach, and the other fingers down the sides. Then descend slowly along the body as far as the knee, or farther, and, if you can without disturbing yourself, as far as the ends of his feet. You repeat the same processes during the greater part of the sitting. You may also occasionally get near enough the patient to lay your hands behind his shoulders, descending slowly along his spine, thence to the hips, and along the thighs as far as the knees, or to the feet. After the first passes you may dispense with putting your hands upon the head, and make the succeeding passes along the arms, beginning at the shoulders; or along the body, commencing at the stomach.

This method of Deleuze, according to Teste, is, in general, that which must be followed when one wishes to begin in magnetizing. Teste ob-

serves, however, that absolute contact of the hands with the head and epigastrium is not indispensable, but, on the contrary, is a subject of distraction, and adds nothing to the efficacy of the treatment. He believes, too, that the passes practised along the spine have no well-marked action. Finally, he states that, as a general rule, all species of direct touch appear to be superfluous. Most usually his method is to stand erect before the one he desires to magnetize, and even at a certain distance from him. After the few minutes' meditation which he says should precede every experiment, he raises his right hand to the height of the person's forehead, and directs his passes slowly downward in front of his face, breast, and stomach, taking care to let his fingers drop in such a way that their dorsal surface is directed towards the magnetized person during their ascent, and their palmar surface during the passes.

"Magnetization by the head" is described by Teste, who regards it as one of the promptest and most energetic processes.

The operator seats himself in front of the person whom he wishes to magnetize. He first makes some long passes downward in the direction of the subject's arm, before his face, and on a line with the axis of his body, after which he extends his two hands at some inches from the forehead and parietal regions, and remains thus for a few minutes. For the whole time that the operation lasts the "magnetizer" varies the position of his hands but little, being satisfied to move them slowly from right to left, then to the occiput, and afterward to the forehead, where he leaves them indefinitely—that is to say, till the subject is asleep.

Magnetization by a fixed gaze requires in him who makes use of it a quick, penetrating look, susceptible of long fixedness. The operator seats himself opposite his subject, and each looks fixedly at the other. Sometimes it is necessary to use a few passes.

"The Abbé Faria, a celebrated magnetizer, who exhibited his somnambulists in public, and who died with the finest reputation as a charlatan that any man in the world ever had, or ever deserved, in order to increase what there was of marvellous in his experiments, and, therefore, to give more *éclat* to his exhibitions, invented a method which had no imitator, and which hardly succeeded except in his own hands. He caused the person who wished to submit himself to his operations to be seated comfortably in an arm chair, requested him to close his eyes, and, after a few moments of reverie, said to him, in a loud and commanding voice, 'Go to sleep.'

"These simple words, uttered amid a solemn silence, by a man of whom wonders were told, usually made an impression upon the patient sufficiently deep to produce a slight tremor of his whole body, along with perspiration, and sometimes somnambulism. If the first attempt did not succeed, he submitted the subject to a second, and then to a third, and even a fourth trial, after which he declared him incapable of falling into an intelligent sleep! This method does not differ essentially from the preceding, except that the cabalistic apparatus with which the Abbé intimidated the weak and credulous minds which yielded themselves up to him, by neutralizing in the latter every sort of moral resistance, prepared them for more promptly receiving the influences of a will which was in some respects powerful."

The method of Heidenhain is similar to that employed by Braid. The latter, however, did not make use of "passes."

In the first place the individual is made to gaze fixedly at a shining faceted glass button for some six or eight minutes, the visual axes being made to converge as much as possible. Any glittering piece of glass, for example, the glass button so often used on ladies' clothes, fixed upon a dark ground, is efficacious. The special form is unimportant. A polished metal ball, etc., can also be used.

Staring at dark objects often leads to the required result, but glittering ones are decidedly preferable. Heidenhain, like Braid, found the most advantageous direction of the visual axes to be that of upward convergence. According to Carpenter, in the fixation, this upward convergence is very important; it suffices of itself in blind people, or in the night, to produce hypnosis. After the fixation of gaze has been continued for some six or eight minutes, the operator strokes over the face without immediately touching the surface, from the forehead to the chest, after each pass bringing the hands around in an arc to the forehead again. The hands must be warm. He either allows the eyelids to be closed or gently closes them. After ten or twelve passes, he asks the person to open his eyes. When this occurs without hesitation, or with only slight difficulty, he again makes the person stare at the glass for some six minutes, and then repeats the passes, which often bring about the hypnotic state, when the simple fixation does not succeed. Hypnosis can often be brought about by repetition when the result fails to be achieved at the first trials. If the eyes cannot be opened, the hypnotizer proceeds, having closed the mouth, to stroke the cheeks, in order to see whether the mouth can be opened again or not. A similar proceeding is adopted with the bent arm and clenched fist.

The methods employed by Bourneville and Regnard, and by Charcot and Richer, were the same, or similar, to some of those just given. They found that sometimes the simple application of thumbs to the eyeballs would induce hypnotism, without the preliminary fixation of gaze. Sometimes, while the thumbs pressed the eyelids, the fingers clasped the temples. Another method was to seat the patient on a chair, and have her look steadily at any object, as a pencil or penholder, placed between her eyes.

After a patient has often been operated upon hypnosis can be accomplished without the use of any special method. Here imagination comes in play, and charlatans find their opportunity. The sole idea that she is going to be put to sleep causes her to go to sleep. Some one said to a certain patient, "Mr. X. is in the next room and is magnetizing you." She went to sleep. The same thing was said to her on another occasion, sleep came on, although the one referred to was not in the adjoining room, was not even in France, and was not thinking of her.

The mode of awakening hypnotized patients is a portion of our subject, the practical importance of which will not be overlooked by our readers. Whenever Braid observed the breathing very much oppressed, the face greatly flushed, the rigidity excessive, or the action of the heart very quick and tumultuous, he instantly aroused the patient, which he always readily and speedily succeeded in doing by a clap of the hands, an abrupt shock on the arm or leg, by striking them sharply with the flat hand, pressure and friction over the eyelids, or by a current of air wafted against the face. Heidenhain makes a few remarks on the mode of arousing from the hypnotic state. Strong stimulation of the sense organs, and every change in their existing condition of stimulation, readily bring about awaking. Bright light falling on the retina, change in the retinal image, when the medium has been staring at an object and another takes its place; application of cold (as by blowing) when the skin is warm, or of heat if the latter be cold—all these suffice to dispel the hypnosis. Not only the hypnotic sleep, but also the local hypnotic symptoms can in this way be removed. The local spasm, caused by acting on the skin, can in a waking medium, with increased reflex irritability, be removed by the action of cold (*e. g.* cold stream of air, ice to the skin). Undoubtedly, too, the soft stroking over the skin in a direction opposed to the original one, must be considered as a change of stimulation.

Hypnotism, and the practice of hypnotization, are not without their dangers. According to Calmeil, "magnetism" has manufactured somnambulists by the hundred. This sweeping assertion we may, however, be permitted to doubt. By some the dangers of hypnotism have undoubtedly been overrated. Braid deprecated in the strongest terms any attempts at hypnotizing among unprofessional persons; and says that he has met with cases in which he considered it unsafe to apply it at all, and with others in which it would have been most hazardous to have carried the operation so far as the patients urged him to do.

Braid speaks as follows in regard to the hypnotic state induced by his method:—

"I have proved by experiments, both in public and in private, that during the state of excitement, the judgment is sufficiently active to make the patients, if possible, even *more* fastidious as regards propriety of conduct than in the waking condition; and from the state of rigidity and insensibility, they can be roused to a state of mobility, and exalted sensibility, either by being rudely handled, or even by a breath of air. Nor is it requisite that this should be done by the person who put them into the hypnotic state. It will follow equally from the manipulations of any one else, or a current of air impinging against the body, from any mechanical contrivance whatever. And, finally, the state cannot be induced in any stage, unless with the knowledge and consent of the party operated on."

According to Duval, however, the imprudent practice of hypnotism may not be without danger to the security of families. Demarquay and Giraud-Teulon speak of a lady, hypnotized and interrogated under conditions analogous to those of other experiments, who undertook, during this state of loquacious sleep, to reply to their scientific curiosity by some confidences calculated to satisfy an altogether different curiosity; and so grave and so dangerous for herself were these confidences, that they hastened to awaken their unfortunate author. According to A. Dechambre the courts have been called upon to pronounce upon a case of rape accomplished during the magnetic sleep.

The dangers which may spring from the spirit of imitation, and the character of contagiousness which may affect neuroses, are dwelt upon by Duval. In 1784 the adepts and victims of Mesmer became so numerous that public order was seriously disturbed. The history of the great epidemics of sorcery and of demonomania is one not infrequently stained with blood. The spirit of the age will probably guard modern investigators from a danger of by-gone days, sometimes alluded to by writers. In ancient exorcisms, we are told the operator himself sometimes became the unwilling recipient of the frenzy of his subject. The devil, according to the theology of this cheerful period, sometimes passed out of the body of the possessed into that of the exorcist.

Heidenhain[1] was led, as a sceptic, to investigate the phenomena of hypnotism, after having witnessed the exhibitions of Mr. Hansen, a travelling mesmerist. His memoir consists of two parts. The first is a semi-popular lecture, delivered at the general meeting of the Silesian society for home culture, on the 19th of January, 1880; the second is a description of new results, obtained in some scientific observations carried on by himself and

[1] In a short paper on *Hypnotism* read before the Philadelphia County Medical Society, October 12, 1881, and published in the *Philadelphia Medical Times*, November 19, 1881, we have already called attention to some of the observations of Heidenhain. We would also refer to this paper for a brief account of some experiments in hypnotism performed by us upon several patients, and for a fuller discussion than is here given of the hypothesis of Heidenhain.

Dr. Grützner. We will give rapidly the chief points brought out and views expressed in the first lecture.

Heidenhain found one of the most striking symptoms of the hypnotic state to be a more or less marked diminution of consciousness. In the slighter forms of hypnotism, the mediums are well able to remember what has occurred during their apparent sleep. In the more fully developed forms, they have no remembrance of what has taken place; but by giving hints and leading questions of their various actions, they are able to call them to mind. In the most complete forms of hypnotism, no remembrance whatever is retained. It can nevertheless be proved that even during the most completely developed hypnosis, sensory perceptions take place; but they are no longer converted into conscious ideas, and consequently are not retained by the memory; and this is undoubtedly because the hypnotized individuals have lost the power of directing their attention to their sensations. One deep in thought hears the striking of a clock, yet does not know how often it strikes till, by subsequent reflection, he calls to mind the number of beats. During free cerebral activity we are extremely liable to pay no attention to what we hear or see. On the other hand, the power we possess of continuously concentrating our attention in definite directions is so great that it continues even in sleep. The immediate impression on the senses and the conscious perception of the impression are, therefore, two different, separable psychological processes, of which the latter presupposes concentration of the attention.

In hypnotized persons, at a certain stage of hypnosis, unconscious sensations cause them to carry out unconscious though conscious-like acts, especially such movements of the experimenter as produce in them auditory or visual impressions. Such terms as "unconscious feeling," "unconscious perception" are self-contradictory; but by them Heidenhain means those material changes in the apparatus of the central nervous system, called forth by impressions on the sense organs, which would, were consciousness present, call forth the respective feelings and impressions.

Movements carried out before a hypnotized person, who apparently has his eyes shut, are nevertheless perceived by the eye. The closure of the lids is, in fact, not complete. It is important to understand this in order better to comprehend the manifestations of the hypnotic state, and also to clear up some of the suspicions of those who are sceptical about the genuineness of the experiments. In some of our own experiments we have had observers to object that the eyes of the one hypnotized, although apparently closed, were not entirely so, and, therefore, deception was being practised. The perceived, but not consciously perceived movements, according to Heidenhain, are imitated.

"I clench my fist before Mr. H., who stands hypnotized before me; he clenches his.

"I open my mouth; he does the same.

"Now I close my fist behind his back or over his bent head; he makes no movement.

"I shut my mouth, still over his bent head, rapidly, so that the teeth knock together; he repeats the manœuvre.

"I noiselessly contort my visage; he remains quiet.

"A hypnotized person behaves, therefore, like an imitating automaton, who repeats all those of my movements which are for him linked with an unconscious optic or acoustic impression.

"The material change brought about in the central organ through the stimulation of the organs of sense, liberates movements which have the type of voluntary movements, but are not really so.

"Thus I can easily induce him to follow me, by walking before him with an audible step; to bend first this way, then that, by standing before him, and myself performing these movements.

"In walking the medium imitates exactly the time and force of my audible steps."

In our daily life imitative movements also occur. In the normal state, the conscious idea of a movement gives rise to that movement; in the hypnotized state it is the unconscious perception of it which calls it forth. Our movements are also linked with those sensations which are connected with the carrying out of the movement in the moved part itself. A passive movement communicated to a hypnotized person is, as a rule, continued by him.

"The peculiarity which a hypnotized person possesses of performing movements so soon as he obtains an unconscious perception, associated in some way with such movements, explains in part the secret by which the experimenter apparently completely subjects his medium to his will.

"In a loud voice he commands the medium to do a certain action; the latter has not the least idea of the order given. The experimenter himself, at the same time that he gives the order, performs the action in such a way that the medium must obtain a sensory impression of it. The sensory impression leads to no conscious impression and no voluntary movement, but suffices to set up unconscious imitation.

"Mr. Hansen, for instance, puts a raw potato in the medium's mouth, and, calling it a delicious pear, invites him to eat; accompanying, however, this request, as eye-witnesses have informed me, by audible movements of mastication. The medium chews away, purely mechanically, without the least idea of the request, or whether he is eating a potato or a pear."

The hypnotized person behaves like one who, in natural sleep, has been dreaming. Heidenhain defines and explains the expression "liminal intensity of stimulation." For every sensation a certain minimal strength of stimulation exists, which must not be diminished, or no sensation at all will be produced. If the quantity of light which falls on the retina be too small, if the intensity of a sound which meets the ear be too weak, then no sensation of sound or of light arises. The smallest strength of stimulation which first produces sensation is called, after Fechner, the liminal value of stimulation. In the hypnotized person the liminal value of stimulation is extraordinarily high; sensory impressions which produce in a normal waking individual vivid sensations, and hence conscious perceptions, are unable in a hypnotized person to pass the threshold of consciousness. Nevertheless, they are in this case none the less active. For the picture imprinted on the ganglion cells by the unconsciously perceived movement acts as a stimulus upon the motor apparatus of the brain, and liberates a similar movement, and the unconscious perceptions leave behind them traces of which he is not conscious, but which occur to his memory when similar external stimuli again force an entrance.

A symptom of the hypnotic state in its most complete development is highly marked insensibility to pain. A pin may be run right into the hand, and only an indistinct feeling of contact is brought about. Immediately on awaking the full sense of pain is again present. The long known fact that the tactile sense and the sense of pain are distinct is corroborated by experiments in hypnotism.

Increased reflex irritability and tonic spasm of the voluntary muscles accompany the hypnotic condition. Stroking the flexible right arm of a subject it at once becomes stiff, since all the muscles are thrown into a condition of reflex spasm. Reflex muscular contraction spreads over the body, when

certain definite cutaneous surfaces are irritated. With slight increase of reflex irritability, those muscles alone contract which lie immediately under the area of skin which has been stroked. Stroking the ball of the thumb causes adduction of the thumb. Stimulating the skin over the sterno-mastoid causes the head to assume the "stiff-neck" position. When the irritability is somewhat more increased, we are able, by a continuous irritation of a definite spot of skin, to set in activity neighbouring and even distant groups of muscles. Heidenhain stroked continuously the ball of the left thumb of his brother, when the following muscle groups were successively affected with spasm: left thumb, left hand, left forearm, left upper arm and shoulder, right shoulder and arm, right forearm, right hand, left leg, left thigh, right thigh, right leg, muscles of mastication, muscles of the neck.

From a study of such phenomena, Heidenhain is inclined to consider that the hypnotic state is nothing more than artificially produced catalepsy.

Numerous illustrations of special phenomena of the motor apparatus, which depend upon the increased reflex irritability and tonic spasm of the voluntary muscles, are given both in Part I. and Part II. of Heidenhain's memoir. We will mention a few of these, in addition to those just quoted; premising, however, that these striking motor manifestations are by no means present in all cases. Disturbances of the sensorium may exist without them. This is the case in simple, deep, reactionless sleep, but also in persons presenting more complicated phenomena, *e.g.*, lively imitation, hallucinations, etc. Others show exactly the opposite condition; in them every hypnotic experiment produces at once marked tonic and clonic spasms which warn us to be cautious.

Sometimes more or less extensive cataleptic rigour becomes established; the limbs thus affected remain in any imaginable position in which they may be placed. The will can only be exerted with great difficulty. If, with great effort, the parts be set in activity convulsions may ensue.

In the nervous central organs are anatomical connections between definite sensory and motor nerves, which are so arranged that the stimulation of the first sets the latter into activity, and hence the muscle it supplies. The connecting link between these two kinds of fibres is constituted by groups of ganglion-cells of the brain and spinal cord. These transmit in a definite manner the irritation of the sensory to the motor nerves. During hypnosis this transmission is rendered so exceedingly easy that, in that condition, reflex phenomena readily occur which in the normal state are not met with. The often quoted experiment of Goltz illustrates this reflex sensori-motor connection. A frog whose cerebral hemispheres had been extirpated, croaked every time the skin of the back between the scapulæ was gently stroked with the finger. In the human subject a similar connection has been shown to exist between the sensory nerves of the neck and the motor articulating centre in the medulla oblongata.

The following are some of the curious reflex localizations determined by Heidenhain and Grützner:—

"Stimulation over lower dorsal vertebræ produced contraction of latissimus dorsi and rhomboidei, with resulting powerful backward movement of both arms and simultaneous flexion.

"Stimulation over last dorsal and first lumbar vertebræ caused tonic contraction of the whole erector spinæ, with simultaneous elevation of the ribs (levatores costarum, intercostales), without accompanying contraction of the diaphragm, and hence passive sinking in of the abdominal muscles.

"Stimulation over the lower lumbar vertebræ and sacral region, the person being seated, caused contraction of flexors of leg, then of the ileo-psoas, and hence, the thigh being fixed owing to the sitting posture, the trunk was drawn down towards the thigh.

"Stimulation of the skin near the sternum: strong contraction of the pectoralis major, so that the arm was drawn to thorax; simultaneous stimulation of the extensors of arm."

This investigation into localized reflex movements from stimulation of definite regions of the skin, is to us one of the most interesting portions of Heidenhain's work. It represents, as he remarks, a new series of phenomena in hypnotized persons. Its bearing upon certain important physiological questions is apparent. We can even see some possible therapeutic outcome of the research. In the treatment of those forms of palsy, spasm, tremor, aphasia, hallucination, etc., dependent upon disturbances of inhibition in the nervous apparatus, it may be found of advantage to apply revulsives, æsthesiogenic agents, or other local remedies, to those cutaneous areas which have been determined, by previous experiment, to be connected centrally with that part of the motor, articulatory, or intellectual apparatus affected.

The possibility of fixing any part of the body in any given position, constituted an essential factor in the exhibition of Hansen. This is easily done, as we have the means, firstly, of causing the medium to carry out any given movement; and secondly, of fixing any part of the body in any given position. We will give one of the examples recorded by Heidenhain. He made one of his subjects sit before him on a chair, and adapted his hands to the seat, so that his fingers grasped the edges. After hypnotizing him, he stroked along his arms, and his fingers took convulsive hold of the edges of the seat. Placing himself in front of the subject, he bent forward; the subject did the same. He then walked noisily backwards, and thereupon the subject followed him through the hall, carrying his chair with him, like a snail its shell. Some miscellaneous phenomena of the hypnotic condition are given in Heidenhain's first lecture. The very first demonstrable symptom of the commencement of the hypnotic state is a spasm of the accommodation apparatus in the eye. After some time, if the hypnotizing is proceeded with, other eye symptoms almost constantly appear. The pupils enlarge to a different extent in different people; the eyes open more widely than naturally; the eyeballs protrude. This complex of symptoms, according to Heidenhain, points with certainty to an irritation of certain fibres of the cervical sympathetic, which have their origin in the medulla oblongata. Other parts of the medulla oblongata are stimulated, as shown by rapid breathing, profuse perspiration, etc.

Part II. of Heidenhain's book is devoted to a description of new results obtained by himself and Dr. Grützner. To some of these we have already referred. Although interesting, many of these results are practically the same as those obtained by former investigators.

Heidenhain and Grützner found that on trying the susceptibility for hypnotism of a great number of persons, the most numerous cases are those in which the incapability of reopening the closed eyes constitutes the sole unusual phenomenon. Next comes a large number who cannot, or only with great difficulty, open the closed mouth; consciousness may be at the same time complete. A spasmodic contraction of the muscles causes the closure of the eye and mouth. In others the spasmodic condition spreads still further over the body. Order them to close the fist and

bend the arm, and (either at once, or after gently stroking along the limb) incapacity of changing the adopted position of the limb is established; exactly the same occurs with the extended legs. With all these phenomena presented by the motor apparatus, consciousness may be quite unaffected or only slightly disturbed. If questions be asked as to what has occurred, the answers are generally right, but not seldom some links in the chain are wanting.

Many of the psychical phenomena observed were of striking character. In many people, more or less profound (reactionless) sleep, mostly, but not always, accompanied by analgesia, alone occurs. When this tendency is present, the sleep can often be most quickly brought about by causing the person to listen, with closed eyes, to the ticking of a watch. Muscular phenomena may be totally absent during the condition of sleep, or there may be more or less developed catalepsy. In others the cerebral sleep is not general; only certain parts of the brain are affected by the inhibition of function. In this state, impressions on the sense organs give rise to unconscious perceptions; these originate movements which are closely associated with the sensory impressions.

Imitation automatism is the first of the class of movements which occur when certain portions of the brain are excluded from action. We have already described some of these imitation movements. After repeated experiments, people who are at first intractable, become quite as precise in their imitation movements as others are from the first. Some curious phenomena of speech imitation are exhibited.

Automatism at command may be shown by hypnotized individuals. A glass containing ink was given to one of the media, with the request to drink some beer. Without the least hesitation, he began to drink the ink. He also, on being told to do so, thrust his hand into a burning light, and with scissors so unmercifully cut off his whiskers, which he had assiduously cultivated for a year, that, on awaking, he was greatly enraged about it. Experiments demonstrating automatism at command, require a less depth of the hypnotic sleep than do those illustrating imitation automatism. These command experiments usually form a striking part of public exhibitions, and often incline observers to scepticism. Their genuineness, in Heidenhain's investigations, was shown by the fact that senseless and ridiculous acts were performed by individuals above suspicion. Many of the supposed phenomena of automatism at command could, of course, be simulated.

It is possible to induce dreams on those who have been hypnotized by talking into their ears. In one of the persons experimented on, a tale always excited changes in the countenance corresponding to the nature of the former. When the hypnosis was over, the person knew scarcely anything of what he had gone through; but by giving hints, he was able to call to mind certain parts of the dreams, but denied any remembrance of others. These phenomena of induced dreaming, and artificial hallucinations, have been well described by Chas. Richet, whom we have already quoted, and who is referred to by Heidenhain. ("Du Somnambulism Provoqué," *Robin's Journal*, 1875; also "Les Démoniaques d'Aujourd-'hui," *Revue des Deux Mondes*.)

In unilateral hypnosis the phenomena of the hypnotic state are present on one side of the body only. In one of the media, by means of gentle pressure upon the forehead and temple of one side, the influence of the will upon the extremities of the other side could be removed, or, at any

rate, to a great extent lessened. Heidenhain found that his brother was so influenced by stroking the left forehead and temple, that immobility of the right arm and leg, and of the right side of the face, with ataxic aphasia, was produced. When the corresponding cutaneous area on the right side was stroked, all the above phenomena appeared on the left side, except the aphasia, which was completely wanting. When both sides were simultaneously stroked, both arms and both legs became cataleptic, but no disturbance occurred in speech or facial movements. A few other suggestive phenomena are recorded under "Unilateral hypnosis."

In unilateral hypnosis some surprising sensory disturbances occur. These disturbances seem to extend to all forms of sensibility. By stroking the skin over one temporal area, very remarkable disturbances are observed in certain sensory processes on the affected side.

Distinguishing between hot and cold by the cataleptic arm was rendered very difficult. In two persons it was found that they could no longer with certainty distinguish when they were touched with a glass full of hot water, and when with one full of cold. Sensation of changes of temperature, therefore, requires a much longer time than the simple sensation of contact. Investigations into modifications of temperature were not pursued at any length.

Prof. Cohn, in conjunction with Heidenhain and Grützner, examined very closely into certain affections of vision in unilateral hypnosis. They found a striking disturbance in the process of accommodation and in the perception of colours in the eye of the cataleptic side. Accommodation spasm, it will be remembered, occurs at the commencement of hypnosis. In unilateral hypnosis, this occurs only on the affected side. The spasm is so great that the near point is only twenty millimetres from the eye. In unilateral hypnosis the sensorium is apparently completely unaffected. Hence it would follow that one hemisphere of the brain suffices for all psychical functions.

The conditions necessary to the induction of the hypnotic state are considered by Heidenhain. He especially emphasizes the fact that no specific force is exerted by the experimenter upon the passive subject. According to him, "susceptibility" to hypnotism depends on the existence of a greater or less degree of sensory irritability; consequently, pale anæmic individuals are most liable to hypnosis. An opposite view is held by others. Heidenhain regards the preliminary staring at the glass button as a means of increasing sensory irritability. Mr. Hansen regards it as a means of quieting. Different people react differently to the various kinds of stimulation: some more readily with cutaneous, others with retinal or aural stimulation. When he speaks of increased irritability of the sensory apparatus, he means not merely the sensory nerves themselves, but also their central ganglion-cells in the cerebral cortex, which brings about the consciousness of the sensation; in fact, all those parts of the brain which act as the sensorium.

To many, we have no doubt, one of the most interesting phases of this subject of hypnotism is that which considers the nature of the hypnotic condition. "It is the fate of every investigation in natural science," says Heidenhain, "that, after the establishment of a series of connected facts, which can be objectively observed, an hypothesis must be established which brings these facts into causal connection with one another."

Mesmer believed that he had discovered a universal fluid, whose opera-

tions he could regulate; that he could concentrate or liberate it; that with it he could preserve health or cure disease. Others have held to the existence of a peculiar vital fluid, capable of being variously affected. Spiritual, electrical, and magnetic hypotheses have had their advocates. The committee of the French Academy attributed the mesmeric phenomena to the effects of the imagination. According to the late Professor J. K. Mitchell, who was the author of one of the ablest papers ever published on "Animal Magnetism," hypnotic effects are produced by induction.

"The mesmeric influence is the effect of what the natural philosophers call induction. The will of the operator acts solely on himself; his altered system reacts by proximity on the subject of the experiment, by an unexplained power, analogous to the equally inexplicable induction of the mechanicians, and the presence of the chemist." (Five Essays. By John Kearsley Mitchell, M.D. Edited by S. Weir Mitchell, M.D. Philadelphia 1859.)

We can, as does Romanes, fearlessly agree with Heidenhain, and all scientific investigators from Braid downwards, in rejecting these hypotheses. We can also agree in dismissing the hypothesis of a "dominant idea" taking hold of the mind, and through the mind influencing the body. "It would clearly be a somewhat difficult matter," says Romanes, "to indicate the dominant idea which, for instance, Athanasius Kircher communicated to a fowl when he made the animal lie motionless upon the ground with its beak resting upon a chalked line, or which Czermak communicated to a crawfish, when he made this animal to stand motionless upon its head." The hypothesis which Braid suggested may also, according to Romanes, be set aside as at all events insufficient to explain the primary facts, or those of the hypnotic sleep. Braid regarded the latter as probably due to a disturbance of the cerebral circulation. Heidenhain shows that it is impossible that contraction of the cerebral arteries is the cause of the hypnosis. Professor Foster was unable with the ophthalmoscope to discover any constriction of the retinal vessels, and Heidenhain was able to hypnotize his brother even while the latter was strongly under the influence of nitrite of amyl.

The hypothesis of Heidenhain is that the cause of the phenomena of hypnotism lies in the inhibition of the activity of the ganglion-cells of the cerebral cortex; the inhibition being brought about by gentle prolonged stimulation of the sensory nerves of the face, or of the auditory, or optic nerve.

Heidenhain refers to the views of the localizationists of the school of Ferrier, according to whom different areas and levels of the brain have different functions. He is decidedly of the opinion that the movements in hypnotized individuals are caused by the sensory impressions calling forth in some part of the brain situated below the cerebral cortex changes which act immediately as stimuli upon the motor apparatus; that hence the apparently voluntary movement of imitation is carried out, like a reflex action, independently of the will.

While the hypothesis of inhibition seems best to cover the ground, it cannot by any means be considered as established. It is a good working hypothesis, far better and more tangible than the older speculations about "magnetic" and "vital" fluids, but perhaps it does not fulfil all the requirements of a satisfactory explanation. As Mr. Romanes puts the question, the physiological principle of inhibition is one which is known to apply to all the animals which are found to be susceptible to hypnotism,

and there can now be little or no doubt that this is the source from which the explanation is to be sought.

We cannot conceive any good reason for Heidenhain calling his book *Animal Magnetism*, discarding, as he does, the "magnetic" hypothesis, and using throughout such terms as "hypnotism," "hypnosis," "hypnotic," "hypnotize," etc. On the whole, we think that Braid's term "*Hypnotism*" is the best. It is neither the embodiment of an hypothesis, nor the apotheosis of an individual, and, therefore, is free from the objections which belong to such terms as "animal magnetism," "electro-biology," "mesmerism," "Braidism," etc.

We will next pass in review some of the most important observations recorded by Richer in his work on hystero-epilepsy.

The first observation is on the influence of light on catalepsy and hysterical lethargy. The patient is placed before a bright focus of light, as a Drummond, or electric light, on which she is requested to fix her sight. In a short time, usually a few seconds, or several minutes, sometimes instantaneously, she passes into the cataleptic state. She is as one fascinated, is immobile, the wide open eye fixed on the light, the conjunctiva injected and humid. Anæsthesia is complete. If the patient was hemi-anæsthetic she becomes totally anæsthetic. She does not present contractures. Her limbs preserve the suppleness of the normal state, or nearly this—sometimes being the seat of a certain stiffness; but they have acquired the singular property of preserving the attitude which one gives them. It is that state which all authors have described under the name of catalepsy. The patient keeps during a long time positions which it would be very difficult to sustain when not in this state. All communication with the exterior would seem interdicted, and she gives no sign of intelligence in response to the numerous questions addressed to her. One interesting peculiarity is the influence of gesture on physiognomy. The features reflect the expression of the gesture. A tragic attitude imprints a severe air on the physiognomy; the brows contract. If one brings the two hands to the mouth, as in the act of sending a kiss, a smile immediately appears on the lips. It is an example of that which Braid calls the phenomena of *suggestion*, of Heidenhain's imitation. The state of catalepsy endures as long as the agent which produces it, that is, as long as the light continues to impress the retina.

If the light disappears suddenly, or if we prevent the luminous ray from passing through the eye by a screen, or simply by lowering the upper lids with the hand, the catalepsy gives place to a new state which differs from it essentially, and which corresponds to that which has been given the names of somnambulism, provoked somniation, nervous sleep, magnetic sleep, etc. It is a special state differing by strong characteristics from true sleep. Charcot prefers to designate it under the name of lethargy. The hysterical lethargy begins abruptly with the cessation of the luminous impressions. If the patient is standing, she falls backwards, the head thrown backwards, and the neck projecting. The eyes close, a whistling inspiration is heard, accompanied by some noisy movements of swallowing.

A very remarkable phenomenon, designated by Charcot *neuro-muscular hyperexcitability*, is developed immediately after the patient falls into the state of hysterical lethargy. It is sufficient to excite mechanically a muscle through the skin, either by pressing or rubbing lightly, to cause a contraction in the same manner as is done in localized electrization. The contraction of a muscle, or of the limbs, persists after the excitation; if a

little strong and a little prolonged, it is easily transformed into a permanent contracture. The excitation of a nerve produces contraction in the muscles, which it innervates. A light pressure made before the lobe of the ear, or at the point of emergence of the facial, brings on contraction of the muscles of the same side of the face. Each muscle of the face touched singly contracts singly. We cannot fail to observe the analogy between these observations and those of Heidenhain on increased reflex irritability. These phenomena of neuro-muscular hyperexcitability are elaborately discussed and illustrated in the contribution of Charcot and Richer to the *Archives de Neurologie.*

A curious difference is noted between the muscles of the face and those of the limbs. In the face it is easy to produce *contraction* of the muscles at the time of the experiment, but *contracture* (persistent contraction) is provoked with difficulty. The latter, however, may be more readily produced in the limbs. Resolution is not always complete. In one case, for instance, the head often preserved a slight degree of rigidity. Most frequently, however, the limbs are in a state of complete resolution.

Other signs which characterize produced hysterical lethargy are a constant trembling of the upper lids, turning of the eyeballs in different directions, and the persistence of anæsthesia total and absolute. The patient, up to this time inert, can, under the influence of certain excitations, enter into a second phase which approaches more nearly to that of somnambulism. If one speaks to her a little sharply, she raises herself and turns the eyes shut, towards the speaker. She can be made to write, sew, etc., with almost as much precision with the eyes shut as with them open. The muscular sense, as supposed by Azam, seems to replace the sight. She replies to questions with more precision than in the normal state. During this second phase, the muscular phenomena of the first persist in the same degree. In order to bring the patient out of this state, it suffices to breathe on the face, or to compress the ovaries. At the moment of returning to herself, she is taken with a pharyngeal spasm, which brings a little froth to her lips, as after a true convulsion. She has no recollection of what has passed during this sleep.

The characteristics of the two abnormal states—catalepsy and lethargy—into which hystero-epileptics may be thrown are summarized by Richer as follows:—

1st. *Cataleptic State.*—The eyes are wide open; total and absolute anæsthesia; aptitude of the limbs and different parts of the body to preserve the situation in which they are placed; little or no muscular rigidity; impossibility of causing muscular contraction by mechanical excitation.

2d. *Lethargic State.*—The eyes are wide open or half closed; persistent trembling of the upper eyelids; convulsion of the eyeballs; total and absolute anæsthesia; muscular hyperexcitability; the limbs in a condition of resolution do not preserve the situation given to them, except the provoked contracture impressed upon them. The lethargic state has two phases: (1) that of *carus* or *sleep*, and (2) that of *somnambulism.*

Sometimes the contracture brought on by mechanical excitation while a patient is in the lethargic state, persists afterwards. This was first noticed more particularly when the patient was awakened from the state of catalepsy, while contractured. It was found later that the contracture sometimes persisted on directly awakening the lethargic patient. In such cases the hystero-epileptic offers all the appearances of one affected with permanent contracture. She appears to be under the influence of what

might be called a diathesis of contracture. The muscles are susceptible of contracture under the action of very different agents, as, for example, the magnet. Supposing the patient to be affected with contracture of the right arm, if the left arm is acted upon by a magnet, by placing its poles near the skin, the left arm becomes contractured, and, at the same instant, the right regains its normal flexibility. In *Le Progrès Medical* for 1878, a case is reported in which the magnet was thus utilized for the cure of a permanent hysterical contracture in a religieuse.

Hemicatalepsy or hemilethargy may be produced on a patient, and they may both exist simultaneously in the same subject. A patient is plunged into the cataleptic state under the influence of a bright light. We shut with the hand only one of the eyes, the patient at once becomes lethargic on the same side only; the other side remains cataleptic. The limbs and face of one side are in resolution, and exhibit the muscular hyperexcitability characteristic of lethargy, while the limbs of the other side have the property of preserving the attitudes communicated to them. We see here conditions analogous to those brought about in the experiments of Heidenhain and Grützner in unilateral hypnosis.

In the experiments at Salpêtrière the hystero-epileptics were sometimes plunged into the states of catalepsy and lethargy under the influence of sonorous vibrations. Two patients, for instance, seated on the strengthening box of a tuning-fork (diapason) are rendered cataleptic. On abruptly arresting the vibrations of the diapason, the patients were plunged into lethargy. The transition must be abrupt in order to bring about the change from catalepsy to lethargy, the light must be suddenly removed, or the vibrations suddenly arrested. If the vibrations are allowed to diminish slowly, until exhausted, the catalepsy persists.

Several curious and entertaining experiments are related by Richer to illustrate the production of catalepsy by an auditory impression.

In the state of lethargy, produced by fixity of gaze, the phenomena sometimes differ a little from those observed when the hypnotism is brought about by other means. The resolution of the limbs is not always complete. During the lethargic sleep, a slight degree of catalepsy sometimes exists in the upper limbs, sometimes in one only. These limbs are the seat of a certain amount of stiffness. Opening the eyes renders the catalepsy complete, and causes the muscular hyperexcitability to cease.

One of the patients described by Richer, ordinarily had a hyperæsthetic zone on the top of the head, pressure on which was very painful. A sort of epileptic vertigo was also produced by this pressure. The patient was readily lethargized by fixity of gaze. Pressure on the top of the head would now bring on a peculiar state of sleep with rigidity, often general. This rigidity disappeared readily by light friction on the contractured members; and now a state of resolution obtained, but without muscular hyperexcitability, and with a condition of somnambulism more perfect than when muscular hyperexcitability accompanies the lethargy. In fact, the patient got up with vivacity, walked easily, and sought to follow the experimenter. Faradic electricity failed to produce contractions when the patient was in this state, although in lethargy with muscular excitability, faradization infallibly produced permanent muscular contraction.

During the state of provoked hysterical catalepsy sight and hearing can be affected by various procedures. The eyes are fixed and seem not to see anything. If, however, an object is lightly oscillated in the axis of the visual rays at a little distance from the eyes, soon the gaze of the

patient will follow these movements. The eyes, and sometimes even the head, seem to turn at the will of the operator. Hallucinations are produced. When the look is directed upwards, the expression becomes laughing, when downwards it is sombre. The cataleptic state may now cease completely. The patient walks, follows the object on which his gaze is fixed, and takes attitudes in relation with the hallucination suggested. Music also will cause her to assume positions related with the various sentiments suggested to her by the music. Sudden withdrawal of the object from before the eyes, or of the sound from the range of hearing, causes a return of the catalepsy. When the attention of the cataleptic subject is attracted, she becomes capable of executing a series of unconscious acts, which produce themselves after the manner of reflexes.

The cataleptic patient, in whom the eye is in such a state as to perceive the movements of an experimenter placed in front of her, will reproduce those movements exactly. The patient usually performs these acts after the fashion of an image observed in a mirror. If the experimenter elevates the right arm, the patient will elevate the left. Movements which are accompanied by a characteristic noise need not be seen to be repeated. If the experimenter placed behind the patient claps the hands, she will do the same, etc. It is unnecessary to point out the similarity of these experiments to those mentioned in Heidenhain's memoir.

The muscular sense carries to the nervous centre the notion of the exact position of the limbs. It may be equally the source of the automatic movements, perfectly co-ordinated, which execute the action of which the position of the limbs is the image. For example, in the angle of a room a patient is placed with one foot on the rounds of a chair, and the two hands seizing the folds of a curtain as in the act of climbing; scarcely has this attitude been communicated to her when, in the twinkling of an eye, she has scaled the chair, and we have great difficulty in holding her back and making her let go the curtain from which she hangs suspended. The same experiment was repeated successfully with several other patients. Another patient placed "on all fours" walked about rapidly, like a quadruped. Placing the limbs in the attitude of the beginning of a hystero-epileptic attack, such an attack could be ushered in.

Another series of phenomena of automatism, more complicated than those already discussed, has been treated of by Mesnet, under the name of the *automatism of the memory and the recollection*. If we place in the hands of a cataleptic patient an object of which she knows the use, we will see her pass out of the state of catalepsy to work with the object. A hat is placed in her hands, she turns it between her hands and places it on her head; an overcoat is handed to her, she puts it on and buttons it with care; given a glass she drinks, a broom she sweeps, etc.

From the experiments just detailed it will be seen that Richer distinguishes four peculiar nervous states: 1st, The state of catalepsy; 2d, the state of suggestion; 3d, the state of lethargy, properly so called, or lethargy with muscular hyper-excitability; 4th, the state of lethargy without muscular hyper-excitability, or the state of somnambulism.

The method of "passes" employed by the so-called mesmerizers or magnetizers, does not seem to have been resorted to much at Salpêtrière; but in a foot-note, Richer expresses his belief in the analogies between the sleep thus produced and the hypnotic state brought about by the methods which he describes. He speaks of a few experiments made in his presence on hystero-epileptic patients. The operator made passes, his gaze fixed on

the patients, holding their hands; he applied his hand to the pit of their stomachs, etc. The patients, at the end of a few minutes, lost consciousness and fell in resolution with their eyes shut; they slept. Contrary to Richer's experience, in hypnotism, however, the coming in of the sleep was progressive, without the least shock, and without the slightest epileptoid sign. Neuro-muscular excitability did not exist. Insensibility to pricking was absolute and general. The patients replied to questions, walked, wrote, etc., in a word, performed certain acts of somnambulism.

Experiments in hypnotism have not been limited to those performed on human beings. The lectures of Professor Czermak, which were delivered in the private physiological laboratory of the University of Leipsic, in January, 1873, contain a *resumé* of interesting observations on hypnotism in animals. These lectures, in discussing the phenomena of hypnotism as shown by animals, also put clearly and strongly the absolute necessity of exact, thorough, and unbiassed methods of observation and investigation.

Czermak, while sojourning in Bohemia, made the acquaintance of a gentleman who claimed that he had not only seen others magnetize crawfish, but had himself succeeded in the attempt. His method, which he demonstrated, was to hold the crawfish firmly in one hand, and with the other make "magnetic" strokes from the end of the animal toward the head. In a short time the crawfish became quiet, and placed itself on its head, in which position it remained motionless until passes were again made in the opposite direction, beginning at the head. Czermak soon found that the crawfish would stand just as placidly on its head without as with the magnetic passes. The reverse strokes were found also to be unnecessary. That the actual change of posture in the crawfish did not depend upon a mysterious fluid proceeding from the experimenter, was proved by experiments in which the crawfish was not touched or held by the hand in any way. In one case the crawfish was suspended by a string around its tail, in another it was rolled on its back by means of a glass tube, and, in both instances it, after a time, remained motionless.

Czermak's interest having become greatly awakened by the curious effects observed in the crawfish, he concluded that he would perform further experiments. He determined first to test the statement, often made, that wild, frightened hens, are liable to become completely motionless, as if enchanted by some magical spell, after being held with gentle force upon the floor or table, where a chalk-line has been drawn the length of the beak or diagonally from each eye. The experiment proved successful. He soon discovered that the chalk-line was not an absolute essential to success.

The investigation of hypnotism in animals is certainly not a study that can be called entirely "new" or "modern." Czermak gives some account of an experiment of old Athanasius Kirchen, a celebrated *savant* and Jesuit from Fulda, who as early as 1646 published in Rome a work, "*Ars magna lucis et umbræ.*" Kirchen tied a hen's feet together with a narrow ribbon and laid the animal on the ground, where, after many cries and violent struggling, it became quiet, "as if," he says, "despairing of escape through the fruitlessness of its motions, it gave itself up to the will of its conqueror." He then drew a chalk-line in a diagonal direction from one eye to the other, loosened the ribbon, and the hen, although left perfectly free, remained immovable, even when he attempted to rouse it. Kirchen therefore affirmed that the hen thought the chalk-line a string by which

it was bound at its feet, notwithstanding that the ribbon had been loosened. This he attributed to the force of the animal's imagination.

Czermak experimented not only upon hens, but also upon geese, ducks, turkeys, and even a timid, unruly swan, and succeeded in placing all these animals in a stupefied condition. He found that a hen, which for a minute had been in a motionless state, caused by simply extending the neck and depressing the head, awoke and flew away; but, on being caught again immediately, could be placed once more in that condition of lethargy, by putting the animal in a squatting position, and overcoming with gentle force the resistance of the muscles by firm pressure with the hand upon its back. Some experiments were also performed upon small birds, upon frogs, and upon pigeons. Czermak concluded that Kircher's *experimentum mirabile* illustrated a real state of hypnotism; also that the proof of the actual appearance of hypnotism in animals was the scientific result of his own observations and experiments.

Heidenhain's researches and those of Bourneville and Regnard seem to have been althogether physiological, or, at least, to have been made without special reference to therapeutical applications. Richer reports here and there a cure of hysteria achieved through the agency of hypnotism. One of the great practical outcomes of a study of hypnotism—a result which indirectly has an important bearing upon diagnosis, prognosis, and treatment—is that indicated by Richer when giving his reason, in his great work, for his long digression upon the different nervous states which it is possible to produce among hystero-epileptics. A knowledge of these states of catalepsy, lethargy, and somnambulism facilitates greatly the study of some of the varieties of grave hysteria. We get a clearer insight into the nature of the disease when we understand thoroughly the phenomena which can be artificially produced in the sick.

In Part II. of Braid's book he reports in more or less detail sixty-six cases in which he claims to have applied hypnotism successfully in the cure of disease. A careful analysis of these cases does not fully support this claim. The list includes cases of loss of sight and hearing, of tic douloureux, anæsthesia, motor paralysis of various kinds, aphonia, rheumatism, headache, spinal irritation, epilepsy, spinal curvature, neuralgia, palpitation of the heart, diseases of the skin, lock-jaw, and tonic spasm. According to Duval, the most useful and incontestable effects of hypnotism in medicine have been obtained in the treatment of certain neuralgias. Demarquay and Giraud-Teulon have indicated the benefits to be derived from it in uterine pains. Duval quotes a success obtained by Sée in a violent attack of asthma.

Hypnotic anæsthesia has been made available in practical surgery. Braid reports several cases in which he employed hypnotism to relieve, or entirely prevent the pain incident to patients undergoing surgical operations. In a number of instances he extracted teeth from patients under this influence without pain. In another patient he made an incision into an abscess connected with disease of the orbital process of the frontal bone, and the patient, being hypnotized, suffered no pain. In an adult with the worst variety of talipes varus of both feet, one foot was operated on in the usual way, and the other whilst the patient was in the primary state of hypnotism. In the latter case the operation was performed without discomfort to the patient. From his experience in a number of cases, Braid infers that if it is intended to perform an operation *entirely without pain*, whilst in the hypnotic condition, the patient's consent should be ob-

tained, but he ought on no account to know *when* it is to be done, otherwise, in most cases, it would foil the attempt.

In 1829, Cloquet amputated the breast of a woman magnetized by Chaplin; Elliotson, about 1843, reported a number of cases of surgical operations without pain, performed on patients while in the mesmeric state. In 1845 Loysel amputated a leg; in 1846, he removed a collection of degenerated cervical glands. Broca and Follin opened an abscess in a woman put to sleep by hypnotism. Guerineau, of Poitiers, amputated a thigh during hypnotic anæsthesia. Esdaile, a surgeon in the British East India service, has written a small book on the practical application of mesmerism in surgery and medicine, in which he reports a large number of operations successfully performed without pain during the mesmeric or hypnotic state.

The question to be considered is whether we have not in our ordinary anæsthetics a surer, safer, and swifter method of producing anæsthesia than in hypnotism. Our present experience has not demonstrated that we have, and it remains for future investigation to decide.

We have endeavoured to give a general view of the subject of hypnotism—its origin, history, operative procedures, dangers, phenomena, applications, etc. Of the genuineness of many hypnotic phenomena we can no longer doubt. Sufficient evidence of this has, we think, been collected in the present paper. Some, at least, of those who have investigated this subject with the expenditure of much time and labour, are above the suspicion of intentional deceit. Some of the names we have mentioned are to us a sufficient guarantee of the good faith of the investigators. While believing this, we feel that we must be careful neither to mislead nor to be misled. We are fully in accord with the sentiments of that eminent neurologist and alienist, Dr. J. Crichton Browne, who, in a recent communication to the *British Medical Journal* (August 27, 1881), in reference to Dr. Beard's experiments in hypnotism, speaks as follows:—

"All experts are agreed that certain curious phenomena which have been designated hypnotism are witnessed under exceptional circumstances in certain animals and human beings; but most experts are equally well agreed that much that has passed as genuine hypnotism has been rank imposture. No practical physician with a knowledge of nervous disease can read the literature of hypnotism, or critically watch a series of hypnotic exhibitions, without arriving at this conclusion. The difficulty is to eliminate the imposture and determine what remains. The process of elimination must, I presume, be carried on by the ordinary methods by which error and falsehood are disengaged from truth. Testimony must be sifted, evidence weighed; and hence the paramount importance of determining the credibility of persons who manifest hypnotic phenomena, a large majority of which may be successfully simulated."

We are also equally in accord with him in the conviction that hypnotism ought never to be resorted to for amusement, or the gratification of curiosity, and its employment for scientific purposes should be as guarded and economical as other experiments on living animals. We cannot, however, entirely agree with him that it is demoralizing and dangerous to those who practise it, if its practice is carried out under proper limitation by judicious physicians. The experiments of Heidenhain, successfully conducted upon several healthy and intelligent students and physicians, show, moreover, that "hysterical girls, effeminate youths, and credulous adults," are not the only subjects who are capable of being hypnotized.

C. K. M.

ART. XVII.—*Artificial Anæsthesia and Anæsthetics.* By HENRY M. LYMAN, A.M., M.D., Professor of Physiology and of Diseases of the Nervous System in Rush Medical College, Chicago, Ill., and Professor of Theory and Practice of Medicine in the Woman's Medical College, Chicago, Ill. Wood's Library of Standard Medical Authors. 8vo. pp. 338. New York: Wm. Wood & Co., 1881.

THE author introduces this work with a very brief and very modest preface. He has endeavoured "to distil into its pages all the excellences of the writers who have investigated the subject of Artificial Anæsthesia." To this, he regrets to say, he has been unable to add anything of substantial value, and for "the inequality and insufficiency of a work performed without access to any library of importance he asks the forbearance of a generous profession."

It is an invidious task to criticize a work in which criticism is thus deprecated. Nevertheless, the subject is one of the highest practical importance, every new work upon it is a matter of deep interest, and duty demands an examination of its merits.

The first question suggested by the open confession of the preface is, as to the right of any one, in this busy age of the world, when the press pours forth a constant stream beyond the power of any one to master, to occupy precious time unless he has something of value to offer. Granted, that it be not original work, but a presentation of the work of others, especially of foreign writers, as the author states this to be, then we have a right to demand that the subject be well presented, and that one principle should scrupulously reign throughout—that of giving due credit to all the sources from which the matter has been derived. The general credit of the preface is not sufficient; it is as unsatisfactory as Franklin's proposition to ask a blessing over the provisions as they came into the house in barrel so as to save daily repetitions. Readers ought to know what in the book is taken from Perrin, and Snow, and Simpson, Sansom, Anstie, Turnbull, Kappeler, and Rottenstein, all mentioned in the preface. Unfortunately they cannot tell from how high or how low a source many of its statements are derived. Sometimes credit is given and sometimes not, and frequently we are at a loss and cannot give praise to the author when he most probably deserves it. For instance, connected with the subject of ethylic bromide there are a number of sphygmographic tracings distinctly stated to be the author's own. Although this remedy is shelved and not of present interest, they constitute good work, original, creditable, and show careful and close study of the subject. But connected with the subject of chloroform there are a great many more observations which we presume are the author's, but he does not say so. He is quoting freely from Kappeler as he introduces them, and we only infer the work to be original. It is the same with the tracings of the effect of ether; it is not clear whether they were made by the author or were taken from the report of the Committee of the British Medical Association.

A natural result of writing a work drawn entirely from other sources, is a want of positive statement, of clearness of expression, and that tone of authority which comes from long practical study of, and familiarity with a subject. We find no exception here. There is none of that inspiration in the pages of this book which imbues the reader with the feeling that he has found a counsellor for difficult points, a reliable guide to lead him

along difficult places. Almost every fact connected with anæsthesia and anæsthetics can be found somewhere in its pages. The doctrines are generally sound; yet we fail to find that clear distinction between the known and the unknown, that emphasis of points of prime importance, and that regular and systematic presentation of the subject so necessary in a scientific treatise, and indispensable in a text-book. Instances will be given as we proceed.

We think the author has been very unfortunate in the arrangement of his matter, and in the amount apportioned to each subdivision. After a chapter of eight pages on history, very good as to American actors and as to those who were on the verge of the discovery, he enters at once into the phenomena and physiology of anæsthesia, and continues the subject in general through the next ninety pages. The individual anæsthetics are then taken up and described one by one, occupying the remainder of the book. The reverse is the natural method, and one almost indispensable to the student. To chloroform there are devoted ninety-six pages, to ether only twenty—amounts out of all proportion, in our opinion, to their relative importance in professional estimation at the present time. Indeed, it is impossible to make out from this work that there is any very wide difference of opinion existing in the profession as to the relative merits of ether and chloroform. The dangers of chloroform and the superior safety of ether are clearly stated, but it is nowhere indicated that there are in our country men of very large experience who are enthusiastic advocates of chloroform, or that there are cities and sections in which it is utterly banished from use, and where a resort to it would be held almost if not entirely criminal.

The opening chapters on the phenomena and physiology of anæsthesia are extremely interesting reading, and furnish instances of some of the faults to which we have alluded. There are some most important chemical observations bearing upon the mode of action of anæsthetics, with which the name of Prof. Walter S. Haines, of Chicago, is associated, as to the effect which various gases and vapors exert in preventing molecular combinations which would take place were they absent. To these follow Bernard's observations upon the effect of anæsthetics on fermenting liquids, germinating seeds, and the phenomena of plant life, and then follows a consideration of the subject of sleep, all undertaken to elucidate the mode of action of anæsthetics in the human economy, a branch of the subject to which the author devotes very considerable attention, but we cannot think him always happy in making the matter clear or in being always consistent with himself. Thus we read that

"The only thing that seems beyond dispute is the fact that anæsthetic substances *tend to diminish the ordinary freedom of chemical change of matter.*" (p. 17.)

But again, that "Like alcohol and chloroform—in short, like all other anæsthetic substances—ether, by the first contact between its molecules and the molecules of tissue-protoplasm, *produces a liberation of motion in the tissues.*" (p. 280.)

In treating of chloroform we are told that "It is, in the present state of science, useless to discuss the nature of the process by which chloroform and other anæsthetic substances act upon the molecular constitution of the cellular elements of the nervous tissues" (p. 113), and "As for the changes that may be produced in the tissues themselves by the action of chloroform transported to them through the medium of the blood in the living animal,

our knowledge is purely hypothetical" (p. 112). On page 27, in answer to the question, "How do anæsthetics act upon nervous tissues?" the author answers: "Reasoning from analogy, it has been suggested that they coagulate protoplasm, somewhat after the manner in which alcohol acts upon albuminous substances outside the body. But coagulation is not compatible with life, consequently it is hardly probable that this can be the mode of motion." On page 234 he says, "The hypothesis of Bernard, who attributed the effects of anæsthetics to a brief and partial coagulation of the protoplasmic elements of the tissues, is probably nearer to an expression of the facts." The last quotation is taken from the chapter on the physiological action of alcohol, which occupies nearly thirty pages, and from a study of which the author thinks we can find "a key to the action of anæsthetics and a reason for the difference that exists between them in the matter of danger." He then continues and thus clears up the obscurities of this difficult subject.

"The truth of the matter, however, lies deeper than this. The cause of anæsthesia is to be sought among the modifications to which the movements of the molecules of protoplasm are subjected when exposed to the influences contributed by the heterogeneous movements of the molecules which compose the anæsthetic substance. In their normal condition the vital phenomena of living protoplasm are dependent upon the permanence of a certain moving equilibrium in which all its constituent molecules take part. If this equilibrium be disturbed by the removal or suppression of certain of its factors, a lower degree of complexity in the movements of the molecular congeries is the consequence. This implies a lower grade of vital manifestation. . . . If the anæsthetic contains a constituent element which cannot under any circumstances enter into a *moving* equilibrium with the other elements of living matter, but which can only be associated with those in a *stable* equilibrium, then we find added to the dangers arising from over-crowding—the *mechanical* dangers—a new form of danger arising from incompatibility." (pp. 235, 236.)

In describing the action of chloroform and the sensations experienced under its administration, the author has done himself more than injustice by copying bodily from Kappeler without any quotation marks or any credit. Page 119 of this work is a transcript line for line, and with a few omissions, word for word, of page 19 of Kappeler's.[1] We will do Dr. Lyman the credit of saying that, had he taken a page from the book of nature, had he written his own observations, he would have made a better description than by trying to follow closely in English the rugged construction of the German language.

In the section on the administration of anæsthetics the directions as to the preparation of the patient and precautions during the process are clear, and good, and complete, with one exception. The author fully recognizes two sources of danger not always appreciated, the great danger of sudden variations in the strength of the inhaled vapor, and that arising from partial anæsthesia, especially when the surgical procedure is sharp and sudden, as in tooth-drawing. The first is not impressed as strongly, we think, as it ought to be for the benefit of the beginner, but, as in regard to some other points, there can be found at another point in the book something more in regard to it. Thus, on page 195 there is a little table which furnishes the emphasis; it shows thirteen deaths immediately after the addition of a fresh supply of chloroform to the sponge! In regard to the second, we are told, on page 48, that in order to avoid this

[1] Deutsche Chirurgie; Lieferung 20; Anæsthetica, Stuttgart, 1880.

danger, "etherization should always be carried to the abolition of the cutaneous reflex manifestations;" on page 73, in the chapter on anæsthesia in dentistry, it is said that "when only a single tooth is to be drawn, if ether is employed, it is unnecessary to proceed to the stage of complete unconsciousness." The apparent contradiction may possibly be reconciled by the discovery that the author has an unfortunate practice of using "etherization" when he means the production of anæsthesia in general.

Indeed, we do not find here, as in a preceding part of the book, that comparison of ether and chloroform, that contrast between their effects, with those clear indications of the modifications to be made in the administration, as one or the other agent is used, which are so desirable, if not necessary for the student. While the general course of anæsthesia is about the same with both, there are wide variations in individual symptoms under each which should be clearly pointed out. Cough, for instance, is of comparative slight importance with ether from its irritating properties to the respiratory mucous membrane; with chloroform it shows at once that the patient is breathing air too heavily charged with vapour. It is the same with stertorous respiration, and so with suffusion of the face, while there is the widest difference as to the admission of air. In giving ether, at a certain stage of the process, air should be entirely excluded for a time, a most dangerous measure with chloroform, and the best ether inhaler is one in which the patient breathes out of and into an impervious receptacle, a point which we do not find mentioned. Nor are the practical difficulties of etherization pointed out as we think they should be for the benefit of the student, nor is there any mention of the fact that some patients cannot be brought under the influence of ether; instances of which are given by Kappeler.

We think the author's surgical brethren of the city in which he resides will scarcely thank him for the representation on page 30, that the ordinary precaution of confiding the administration "of even the more dangerous anæsthetics" to one competent person, whose sole duty it shall be to attend to it, is "often neglected," that this important duty is "confided to the junior assistant—perhaps to a student scarcely out of his teens—a youth without experience and without any adequate comprehension of the real nature of the process in which he is engaged." On the next page, speaking of patients who resist the anæsthetic, it is said that "it is not uncommon to see a half dozen assistants throwing themselves upon the struggling form of their victim, while several youthful doctors deluge his head and face with a shower of ether—perhaps even chloroform may be discharged upon him with equal liberality." We regret to read this in a book which, abroad, may be taken to represent our country on the subject of anæsthetics. It certainly cannot be true, although the author writes as if he frequently witnessed it. We have personal acquaintance with some surgeons in Chicago, and know them, as we know others from reputation, to be the peers of any men anywhere, and feel positive that they do not permit such disgraceful scenes, and that they fully appreciate and practise a precaution which is now observed everywhere. The fact is, the author's remarks apply to a former period of anæsthesia; they have not been true of this country for more than a decade at least. The explanation of their appearance here we believe to be the unfortunate manner in which the book is made up, by copying here and there from different writers of different periods.

We have yet to note the exception to the precautions directed to be

taken in preparing for anæsthesia. It is an important one. Within a few years past Dr. Emmet has called the attention of the profession to a connection between accident from the inhalation of ether and the presence of albuminuria in the patient. The proofs are so strong, the published cases so numerous, that no one is justified in administering ether without a previous examination of the urine, unless circumstances will not permit the delay. We find no mention of this point in the book.

We are glad to find a full recognition by the author of the fact that all anæsthetics are dangerous, and that death has been occasioned by each of them. He is not one of those who has his pet agent, and when an accident is reported from it, will resort to any amount of quibbling to throw the responsibility upon something else. He gives a pretty full collection of the deaths which have been reported under ether, amounting to twenty-seven in number. The list, however, does not contain the case which occurred to Dr. Dandrige, of Cincinnati, which, considering its recent occurrence and its proximity to the author, is surprising. There is, however, no classification, critical examination, or analysis of these cases of death, in order to show how much of the catastrophe was really due to the anæsthetic and how much to the operation or other influences. This is also true in regard to the deaths under chloroform, of which he gives a list of 393, as against 370 in Dr. Turnbull's work. The publication of these deaths, as here given, is utterly valueless for scientific purposes. They are incomplete and indefinite, some of the reports extending not even to two lines. Cases of death during such operations as ovariotomy and amputation of the hip-joint figure as deaths from chloroform, and cases of self-inhalation or of administration by a nurse or dentist are counted as of equal value with those in which the remedy was given by skilled hands. The injustice of this is apparent, and we shall return to it. Nothing will yield a richer return to any one who undertakes it than a careful study of the deaths which have occurred from this anæsthetic. But, in order to yield any benefit, it must be a study. The facts must be weighed, not merely numbered, and we look upon the lack of this here as one of the most important failures of the book.

As an instance of the extreme brevity with which some most important points are passed over, we give all there is in the book on the administration of anæsthetics during the shock of injury.

"For the same reason (extreme cardiac debility), anæsthetics should be avoided during the period of shock after severe injuries. The respiratory centres in the medulla oblongata may have been damaged by the violence of concussion, so that they are no longer in a condition to tolerate the additional effects of artificial toxæmia. Hence the wisdom of the surgical rule to defer operation until the establishment of reaction." (p. 49.)

This is followed by the statement that "the experience of military surgeons is unanimously in favour of the almost unrestricted use of anæsthetics in the surgery of the battle-field," and this is all there is to be found in the book upon this most important point, and one in regard to which the young practitioner finds the greatest difficulty in reaching a decision. But this is not all; when an author places himself in opposition to his professional brethren, he owes it to himself and to his readers to present either arguments or proofs to sustain his position. Turning to such surgical authorities as we have at hand, we cannot find that "surgical rule," the wisdom of which is alluded to above. Gant, and Savory in "Holmes' System," alone reject chloroform in shock, and they do not mention ether.

But, on the other hand, Holmes, in his "Manual," Gross, Erichsen, and Bryant, distinctly advocate the use of chloroform in shock, some of them claiming that its depressing effect is not so much to be feared as that of further pain, and some that the pulse will rise under the use of even this anæsthetic. Agnew advocates anæsthesia during shock, decidedly preferring ether; while Ashhurst advises a cautious use of the same agent, watching effects. We believe these authors furnish the text-books of nineteen-twentieths of our students.

To the medico-legal relations of anæsthetics the author devotes eighteen pages. The mode of examination of a case of suspected death by suicide or otherwise, is very well detailed, and what, or how little, is to be learned from a *post-mortem* examination given from, and duly credited to, Caspar and Tourdes. This branch of the subject contains three principal subdivisions, all of them important and of the greatest practical interest. They are: the responsibility which attaches to the practitioner in the choice of the agent used; the possibility of the administration of chloroform to sleeping persons; and, assault upon females while under the influence of an anæsthetic. In regard to the first, there is of course no longer question that chloroform is a much more dangerous agent than ether; on the other hand, it is effective, rapid, and reliable, and pleasant to the patient, while ether is more difficult of administration, far more unpleasant to the patient, and out of all proportion accompanied and followed by unpleasant symptoms. The greater amount of danger incurred by the use of chloroform has not been and can never be stated accurately in figures. The profession is, therefore, divided in regard to the use of the two agents; in some cities and sections chloroform is utterly banished, in others ether is not used. Under these circumstances there is a question of responsibility—not only of moral responsibility which every man must decide for himself, but of legal responsibility, which the profession must be prepared to meet. To writers upon anæsthetics, to those who take position as authorities, we must look for guidance, or for such clear expression of opinion as will serve us for defence in case of accident, or show us that all the weight of doctrine and custom as to anæsthetics is against us. Dr. Lyman opens this inquiry and marches up to it boldly. "Are all anæsthetics possessed of properties which may render them dangerous to life? And are these dangers so far inevitable that in no individual case can they be foreseen and in some measure avoided?" Then, having asked these pertinent questions, he—does not answer them; not squarely and fairly, as they deserve to be answered. On the next page (81) we read that "all anæsthetics act by the development of a tendency to death," and "to continue to employ certain articles without restriction can only be deemed unjustifiable and culpable." Why not say chloroform, if he means that agent? Turning to another part we find something more upon this point, of which we italicize a portion:—

> "The verdict of experience is decisive, and the dangers of anæsthesia are known with a degree of precision sufficient to render the administrator responsible for all accidents which may be foreseen, as a possible, if not probable, consequence of the physical condition of the patient, and *of the nature of the agent selected for the production of insensibility.*" (p. 51.)

Well and good; no fault can be found with any one who, after careful study of the subject, shall take this position. But is there no word to be said in favour of chloroform? In this country there are cities in which this agent is almost exclusively used; there are men who make deliberate

choice of it for daily use with full knowledge of its dangers; nor are they mere theorists, but men whose experience extends to tens of thousands of administrations, who are as honest, as intelligent, as conscientious as any advocate of ether, and who are enthusiastic in support of it as being the best anæsthetic. Is the testimony and the experience of these men to go for naught as to a justification of the use of chloroform? And are there not circumstances which would justify the use of chloroform, such as, for instance, the inflammability of ether, and the consequent danger in operations by artificial light? And if chloroform be so dangerous, and the danger is not entirely abolished by using mixtures which dilute it, as has been certainly shown by experience, then is it justifiable to use a mixture containing any proportion of chloroform? Or, in other words, will very great practical advantages justify a man in exposing a life to any, even if it be very slight, danger? These are questions which we think ought to be broached, fully considered, and carefully answered by any writer who now undertakes to present a complete treatise on anæsthesia and anæsthetics. We do not find them here.

In regard to the possibility of the administration of chloroform to sleeping persons without wakening them, the author quotes from Dolbeau and from Drs. Cluness and Quimby, of this country, giving in all fifteen cases in which the attempt was successful and thirty-three in which it was unsuccessful. In one of these quotations we find the truth stated, that chloroform can be thus successfully administered, but only by one skilled in using it. The author himself gives no summing up, strikes no balance between the successful and unsuccessful cases, and expresses no opinion on the subject which would aid an advocate in prosecution or defence.

In regard to alleged criminal sexual intercourse when the woman has been anæsthetized for an operation of some kind, due attention is paid by the author. That erotic sensations are sometimes excited by anæsthetics, especially by ether, is fully recognized, and plenty of cases given for the defence of any one accused. Upon this point, however, it can only be said that after the amount of experience published in regard to this matter, if any one can be found hereafter fool enough to administer an anæsthetic to a female without other persons being present, he deserves no defence! Upon the administration of the anæsthetic as an aid in the criminal assault, we find the author far from satisfactory. He devotes not more than a dozen lines to this very important point. Most justly does he say that "the fact of intercourse should be established by evidence more satisfactory than the mere assertion of the woman;" but he fails to point out a principle which, we believe, underlies these cases, and which may serve as a sure and reliable guide. Let us take a case from real life: the prosecutrix swore that when in bed the prisoner gave her something by inhalation which she believed to be chloroform, and then had intercourse with her. *She swore to sensations and penetration.* She was within easy call of other persons, yet swore that *she could not cry out or make any resistance.* Now, in our opinion, this was a clear and easy case for the medical expert. He could swear positively that under anæsthetics, sensations of touch and of pain are abolished before the power of resistance or of making outcry. Too often, on the witness stand, are we obliged to admit uncertainty and variability of the action of medicines. When we can swear with positiveness upon any point, we may prize it as a jewel of rare value. This is one of the jewels. Not so the author. Turning again to another part of the book, we find the following, which we italicize:—

"*By an effort of the will the progress of anæsthesia may be delayed. By such effort, and even without apparent effort, perfect intelligence may often be maintained for a considerable period after the loss of the power of perceiving painful sensations.*" (p. 11.)

This is dangerous doctrine. We do not believe it. It will send innocent men to the penitentiary. We protest against it, and we base our protest and denial upon all our experience in the administration of anæsthetics, and upon what we believe to be a very considerable experience in inhaling it personally. This doctrine must have been derived from the early and mythical age of anæsthesia, or if there be possibly any foundation for it in fact, it is only furnished by cases so rare and infrequent as not to affect the general rule.

To artificial anæsthesia in obstetrical practice the author devotes four pages in which we do not find the impress of any practical experience. He justifies anæsthesia in labour by the reasoning that "really normal labour is not a painful process;" that "in civilized society the majority of mankind are living under quite abnormal conditions;" this entails pain, and we no longer have to deal with natural labour, and, therefore, may give chloroform. So that Rome is reached at last it makes little difference what road is travelled! As to the choice of an anæsthetic, it is chloroform of course, except when complete anæsthesia is to be produced, when, he says, ether should be preferred. Also—

"For the relief of convulsions it is necessary to produce complete anæsthesia. This should be effected by the inhalation of ether." (p. 71.)

This is new doctrine, as chloroform has long been considered one of the most reliable remedies for this accident of parturition. Further on we find its value duly appreciated and stated:—

"Puerperal convulsions may in like manner be arrested by the active employment of chloroform. . . . The symptom *convulsion* is due to an over-excitable condition of the convulsive centres in the upper portion of the medulla oblongata and its protuberance. This inordinate irritability is promptly subdued by chloroform." (p. 115.)

The author rejects all the explanations which have been given to account for the immunity of women in labour from accident under anæsthetics, and ventures one himself, which is that "the greater immunity of these patients is probably due to the fact that they are selected patients, as it were. Young women in the prime of life, at an epoch when all the nutritive functions of the body are at their highest degree of activity;" an explanation which is as unsatisfactory as any of the others when read by the light of the table of deaths from chloroform given on page 194. Of 255 deaths, 147, or 57 per cent., were in patients under 35 years of age!

In connection with deaths from chloroform during labour, there are one or two notable points. As before said, it is but in accordance with the plainest principles of justice that a remedy should not be held responsible for accidents which may have followed its use in incompetent hands. Yet chloroform has had that injustice done it, and the injustice is perpetuated here. In the tables of death of several authors "two during natural labour" have been repeatedly given, evidently copied one from the other. The writer undertook the task of finding these two cases, but for years without success, until, finally, after much inquiry, he took the ground that no death from chloroform during natural labour had ever occurred, *the agent being administered by a competent medical man.* Not until the appearance of

that admirable work the Catalogue of the Library of the Surgeon-General's Office, could he succeed in finding any reference to the two cases above referred to. They are found here in Dr. Lyman's book with four others; the summing up being: "Death was caused on six occasions by the inhalation of chloroform during the pains of natural labour." We will examine them in order to illustrate the injustice done, to which we have already alluded, by a mere statement of so many deaths from chloroform in such and such circumstances. The first, No. 57, was a case of self-inhalation, no physician present. Nos. 79 and 80 are the original two so long sought for unsuccessfully; the former is the exact counterpart of No. 57; the latter is merely mentioned by Dr. Matthews Duncan, and so devoid of particulars as to be of no scientific value whatever. The next, No. 327, occurred at Lyons, was a shoulder presentation, therefore not a case of natural labour; the chloroform was given for version by a nurse. No. 328 is reported by Dr. Cotting in this country; it was a case of convulsions, again not a natural labour; "after the delivery of the head the patient shuddered (that is, had another convulsion!), her pulse ceased, and she was dead." Here are five cases; the sixth is the last of the author's list, No. 393, and bears the date of March, 1881. It seems to be a genuine case of death during natural labour under chloroform administered presumably by a competent medical man! It seems wonderful that so important an addition to our knowledge, a case unparalleled in all the time during which chloroform has been used, should be presented by the author without comment, or without a word to indicate that it is different from the vague and distant cases we have just given. But so it is. Moreover, we have not even a full and complete report of the case. It occupies only twenty lines: "the physician allowed her to inhale, intermittently, a few drops at a time. She did not become unconscious, and at the end of ten minutes began to complain of a sense of thoracic oppression and dyspnœa, . . . she frothed slightly at the mouth; the cheeks were blown out in expiration, and, after half a dozen sighing respirations, she ceased to breathe." We are not told whether this is the original report of the case, the whole, or any part of it. It is credited to Wallace K. Harrison, but without reference to any journal or source where the original report may have been made. This, to any one making a close study of the subject, is, to say the least, provoking. We feel it to be so because it was our fortune, or misfortune, to meet with a death during labour presenting almost identical symptoms, in which no anæsthetic had been used. It was in days before anything was known of pulmonary embolism, and we attributed it to heart disease, but, as in the case above, no post-mortem examination was allowed.

The modification of the anæsthetic process by a preceding hypodermic injection of morphia receives due attention, but it consists of a detail of the experience of those favourable to it, and of those who have been unsuccessful with, and are opposed to it, without any comment of the author's, or any expression of opinion as to its value. The student could not gather from this book that this was very much of an addition to our practical knowledge. Kappeler's opinion as to the bad effect of morphia injections before ether-inhalation is given, but no attempt made to clear up or add to our knowledge of this unsettled point in the realm of anæsthetics. Our experience, using a mixture containing one-half ether, has been so directly contrary to Kappeler's that we looked for more light upon the subject with deep interest. Mixed vapours receive but scant attention, and are dismissed with the old, old, and we feel compelled to say, frivolous and pue-

rile objection, about the different rate of evaporation of their constituents! as if during administration by a skilled or intelligent operator vaporization would go on as it does when the mixture is poured on a cloth!

The author has presented a full account of the various minor and little known anæsthetics, he gives evidence of careful study, physiological however rather than clinical, and of a full acquaintance with the literature of the subject. We deeply regret that we cannot estimate higher the manner of execution of the work. J. C. R.

ART. XVIII.—*Transactions of the American Gynecological Society*, Vol. V., for the year 1880. 8vo. pp. 470. Boston: Houghton, Mifflin & Co., 1881.

THE work of the society comes to us in its usual dress; but the interval of almost a year, from the reading of the papers until their appearance in print, will have a tendency in the future, to divert valuable matter to other avenues of publication, unless authors can be assured that promptness will be secured for them hereafter. The fault, we are told, lies very largely at the doors of the writers themselves, who either present their articles in an incomplete form, or are a long time in their final preparation for the press. If this is so, there should be a rule enacted, to the effect, that all articles should be fully prepared for publication before being read, and be at once presented to the secretary for the volume. The President in his annual address shows a great anxiety to enlarge the list of Fellows: perhaps it would materially aid this, if the medical writers of our country could be made to feel that their papers, if presented before the society, would be promptly distributed to the profession in printed form. In these days of surgical progress, it is important that many clinical and other records should be published promptly, or they will fail largely of their object. Those making researches feel this, and cannot be expected to use a medium which is not only of limited circulation, but slow in publication. The so-called exclusiveness of the Gynecological Society, and its exacting ordeal of admission, will weigh but little with those having the requisite qualifications, provided they can be satisfied to give up valuable articles to their medium of publication as one prompt in action.

What is the Proper Field for Battey's Operation? by ROBERT BATTEY, M.D., of Rome, Ga., is the title of the first paper. However much this operation may have been abused and improperly applied, it can hardly be said that its originator has given countenance to its too general application. Contemplating the propriety of the operation for six years before performing it, Dr. Battey has always contended that it should ever be regarded as a final, and almost compulsory expedient for relief. Since its introduction nine years ago, Dr. Battey has performed but few operations compared with those of Alfred Hegar, Lawson Tait, and some others in Europe; and he now expresses his views as follows, upon the necessity for this form of mutilation, prefacing them with the remark that the ovaries should only be sacrificed for grave causes, and as a last resort. 1. The operation is required in cases of congenital absence of the uterus with functional activity of the ovaries, resulting in fatal heart disease by reason of a menstrual molimen unrelieved by menstrual flux. 2. Where

there is an occlusion of the entire genital tract, as a sequence of labour, where restoration of the outlet has been found impracticable. 3. Cases of menstro-mania, where all other remedies have failed. 4. Ovarian epilepsy, in which the convulsive action is evidently due to a disease of the ovaries, or to some abnormal condition of ovular action. 5. Certain forms of chronic inflammation of the ovaries, attended with severe pains, and nerve disturbances, at the menstrual period. 6. Amenorrhœa with grave disturbances of the nervous system, unrelieved by the menstrual function or by medical treatment. 7. Hernia of the ovaries into the inguinal canal, or into the labia, disabling the woman by excessive sensitiveness, pain, and suffering. 8. Large submucous and interstitial fibroids, accompanied by dangerous hemorrhages. 9. Certain incurable flexions of the uterus, attended with grave consequences requiring relief. 10. Deformities of the pelvis endangering a necessity for the Cæsarean operation. Dr. Battey regards the removal of the ovaries as likely to add but little danger to the Cæsarean operation. This expedient has been tried but once in the United States, in a patient upon whom the Cæsarean section was being performed for the second time. The woman died of peritonitis in ten days. Ligating the Fallopian tubes has been performed with better success.

Dr. GEORGE J. ENGELMANN, of St. Louis, reports two cases of this operation, for "*Anterior Displacement of the Ovary, simulating Inguinal Hernia.*" He shows this to be a rare form of displacement, very few cases having been reported. *Case* 1. An American girl of twenty-four, much emaciated and inclined to melancholia. Health been failing for five years, but particularly for half this period, since a fall on her feet from a second story window. Suffered severely at each menstrual period since the fall, directly after which, a swelling in the groin appeared, which has always been most noticeable during the catamenial flow, at which time she can scarcely walk, and is often obliged to keep her bed, as she is unable to straighten her left leg. She had been under a variety of medical treatments, but to no avail. The removal of the ovary gradually restored the health of the woman, and she was able to resume her position as a servant in about three months. *Case* 2, was of the right ovary in a married German woman of forty-six. She had never conceived, was always delicate, and had been thought ruptured by injury, at the age of three years, and had worn a truss interruptedly from that age to about forty. When about twenty-one, she increased her disabilities by a fall in a sitting position, since which time her sufferings have been aggravated, especially those of a nervous character. She has become melancholy; has hyperæsthesia of the skin, so that at times she cannot bear any pressure from her clothes; has a feeling of pressure and irritation in the rectum; is nervous and careworn; suffers with pelvic pains, insomnia, and mental troubles. She had been under the care of physicians here and in Europe, but had experienced no decided relief. An examination revealed enlarged nymphæ, a narrow rigid vagina, and a retroverted uterus; right ovary distinctly felt anterior to the womb, sensitive, and little if at all enlarged; examination very painful; sounding uterus gave suffering in the rectum, which, when explored, gave no evidence of disease. Left ovary not dislocated, but over-sensitive. Being near the menopause the removal of the right ovary was not urged, and in fact it gave but little hope of success. Later in the history of the case her irregularity in menstruation indicated its approaching cessation, and with it, there was a diminution of suffering,

and the ovary no longer descended as in former times, under straining or position.

Dr. Engelmann favours decidedly the removal of the ovaries when required, by incision through the *linea alba*, instead of the vagina; or in cases of hernia, instead of the groin. Dr. Barker had met in practice with three cases of anterior displacement of the ovary, and in them there was no history of a fall: he inclined to the belief that such displacements were congenital. Dr. H. P. C. Wilson reported one case in which he proposed shortly to remove the displaced organ, as it had not been relieved by therapeutical and mechanical means. Dr. Byford had removed a hernial ovary twenty-five years ago, not knowing the nature of the tumour until he had opened the sac. The case resembled the first of Dr. Engelmann, and recovered. He believed that in all cases requiring Battey's operation, the ovaries would be found diseased, either cystic, smaller than natural, or congested. Such had been the case with those he had removed. Dr. Thomas Wood reported the case of a lady who bore three sons and three daughters after he had removed one ovary for disease; and another in which he had six years before removed the entire uterus; leaving the ovaries so as not to change her sexual character, which he believed in a measure dependent upon their presence. With regard to the establishment of the menopause, and the effect of oöphorectomy upon uterine fibroids, Dr. Battey, in answer to inquiries, replied, that in all of his fifteen cases, where he had removed both ovaries, the menopause had been established: but that where he had only removed one ovary, menstruation continued. Theoretically, we should expect, by the diminution of the influx of blood into the uterus, to produce a gradual reduction in the size of fibromata: but practically this result is uncertain. Hegar, after forty or fifty operations, believes in their atrophic effect upon this class of growths. Lawson Tait confirms this opinion after having had 31 operations.

Dr. Byford reported *The Successful Extirpation of an Encephaloid Kidney.* The subject was a German woman of 39, living in poverty and operated upon in hospital. The diagnosis was a difficult one, but negative evidences inclined the staff to believe the abdominal enlargement due to renal growth, which, under an exploratory incision, proved to be the case. The kidney was removed under carbolic spray, and weighed 4½ pounds: this was on March 14, 1878. Woman gradually recovered her health, and in time became stout and florid. Two years after the operation she appeared to be in perfect health, and nothing abnormal could be felt in her abdomen or pelvis. The ascitic fluid in this case was thought by Prof. Danforth to present the ovarian cell. Dr. Drysdale said he had seen a cell that resembled that of the ovary; it was the *pyoïd* cell of Lebert: he had always been able to distinguish between it and the true ovarian.

Dr. A. Reeves Jackson, of Chicago, advocates *Uterine Massage as a Means of Treating Certain Forms of Enlargement of the Womb.* As this is a new method of treating that obstinate condition, hyperplasia, either of the whole uterus, or the body alone, we will give the author's own description of the processes, abdominal, abdomino-vaginal, and abdomino-rectal.

1. *Abdominal Massage.* "When the enlarged uterus can be felt sufficiently above the pubes to enable any part of its walls or fundus to be grasped between the fingers, very efficient massage may be done without invading the vagina, and this method should be preferred in all such cases, provided the vagina is small or unduly tender. The bladder being previously emptied, the patient should lie

upon her back upon a table, or upon a hard unyielding mattress or lounge. The operator then, using both hands, commences by picking up and rolling between the thumb and fingers portions of the skin and other superficial tissues. The entire abdominal surface as high as the umbilicus is thus manipulated. The process is then repeated, the deeper tissues being this time taken up and pressed between the fingers gradually increasing force being employed. These pinchings are alternated with rubbings of the surface with the palms of the outspread hands and the points of the fingers. After five or ten minutes have been spent in this manner, the fingers are sunk deeper into the hypogastric and ovarian regions, and the uterus, so much of it as can be reached, is brought between their tips. The organ is then alternately squeezed and relaxed and rolled between the fingers in every possible direction for twenty or thirty minutes, or until the patient becomes weary.

"All the foregoing processes must be performed in the gentlest possible manner, all increase of force employed being so gradual as to be almost imperceptible.

"In whatever manner the massage is employed, this preliminary manipulation of the abdominal walls is advisable, and sometimes indispensable; for in many cases the pains and discomfort complained of by patients who have enlargement of the uterus, and which are likely to be referred by them to that organ, really have their seat in the walls of the abdomen, and unless these latter become accustomed to the massage, which almost invariably lessens the sensitiveness, it would be impossible to act effectively upon the uterus beneath. I have no doubt on this point; for in some instances several days have elapsed before the tenderness of the abdominal walls could be overcome; yet, this having at last been accomplished, the uterus could be grasped and firmly pressed without causing any great amount of discomfort." (p. 86.)

2. *Abdomino-Vaginal Massage.* This form of manipulation is to be employed in cases where the uterus has not attained size sufficient to be reached by the abdominal method.

"This is performed by passing the first and second fingers of one hand into the vagina, and placing the other hand above the fundus uteri in the hypogastrium. A single finger in the vagina is not sufficient; it cannot be introduced as far as two, and is also not so useful for making pressure or counter-pressure.

"The fingers should be passed first into the space behind the vaginal portion, which is pulled gently forward, and then permitted to return to its former position. This is repeated a half dozen or more times, when the fingers are pushed higher up, so as to reach the supra-vaginal portion of the cervix and lower part of the body. The upper part of the uterus being now steadied by the hand on the outside, it is pressed between the fingers of both hands, repeatedly, for a few seconds at a time, and then relaxed. Every portion of the organ which can be reached should be subjected to these momentary squeezings. Then the manipulations should be reversed. The intra-vaginal fingers should be drawn in front of the cervix, and the latter pushed backwards several times as far as possible short of causing pain. Then their ends being passed into the space between the bladder and cervix, and their pulps turned against the latter, the fingers of the outside hand should be so adapted that the uterine body may again be brought between the compressing forces, when the squeezings and imparted movements are to be repeated as before. Alternating with the processes described, the uterus should be frequently elevated in the pelvis and held for a few seconds."

3. *Abdomino-Rectal Massage.* This, from the author's statement, must be of very limited value or application. Although a ready means of reaching the uterus for massage, the offensiveness of the method, the pain of using two fingers, and the irritable nature of the bowel, render it almost impracticable, unless it may be in very exceptional instances of dilated rectum and contracted vagina.

Attached to the paper of Dr. Jackson are the records of three typical cases illustrating the effects of the method. In case 1, where the uterus

was large, soft, retroverted and tender, and measured by the sound 3½ inches, there was but very slight reduction, perhaps a quarter of an inch after six weeks' ordinary local and constitutional treatment: but six weeks' daily treatment by massage, from fifteen to forty-five minutes each, reduced the measure to 2⅞ inches, restored the uterus to a firm texture, and removed its sensitiveness entirely. In Case 2, the uterine depth was 5½ inches, which was slowly reduced to less than four, the patient recovering her health, menstruating normally, and having no leucorrhœa, pelvic pain, tenderness, or vesical or rectal disturbance. In Case 3, after massage for three months, three or four times a week, the uterus of treble its normal dimensions was diminished to a depth of three inches, and its shape and functions were restored to a natural condition.

A Case of Cataleptic Convulsions cured by Trachelorraphy is reported by R. Stansbury Sutton, M.D., of Pittsburg. The patient in this case suffered from a partially cicatrized laceration of the cervix, which was so sensitive that a convulsion could be readily excited by touching the bottom of the fissure, and she was subject to frequent convulsive attacks. The removal of the cicatricial tissue and closure of the rent by sutures entirely restored the patient to health.

Ovariotomy during Pregnancy is the title of a paper by H. P. C. Wilson, M.D., of Baltimore. The question often presents itself to the gynecologist, whether he shall temporize by reducing an ovarian tumour that complicates a pregnancy by repeated tappings; or attempt its radical cure by extirpation. Dr. Wilson in this paper advocates the latter, especially in the early months of gestation, as preferable to, and quite as safe as, if not eventually safer than, the former on account of the serious adhesions produced by the tappings interfering with a post-partum removal of the cyst. Besides the danger from tapping, the development of an ovarian cyst, during pregnancy, endangers the twisting of the pedicle and bursting of the cyst. Dr. Wilson reports a case in which he operated at four months, wherein he found the pedicle twisted, and clots of blood within it, which escaped when he cut it, after ligation. The patient carried the fœtus nearly to term, and the child was saved.

The statistics of ovariotomy during pregnancy, as given by Dr. Wilson, are as follows: Mr. T. Spencer Wells, 10 operations; 9 recovered and went to full term. Prof. Schrœder 7 operations, all recovered; 1 aborted, 2 delivered prematurely, and 4 went to full term. Dr. J. Marion Sims, 1 operation at four months, delivered at term; child living. Dr. Washington L. Atlee, 2 operations, 1 at two months, unsuspected. Patient had been tapped sixteen times, eleven before marriage; tumour weighed eighty-four pounds; great gastric irritability resulted, and woman died of inanition in a month. In the second case the pregnancy was also unsuspected; a sound was introduced into the uterus on the day of operation; notwithstanding which the woman bore a living child at term. Dr. J. F. Bird reports a case where there were no signs of pregnancy; patient aborted, recovered, and bore a child subsequently. Dr. A. L. Galabin operated at six months; patient delivered at term; child living. Mr. Lawson Tait operated at seven months; labour on sixth day; patient died in a few hours afterwards. Case reported by Wilhelm Baum, pregnant five months; miscarried the next day; woman had a pelvic abscess, but recovered. Dr. T. G. Thomas, 1 operation, before antiseptic measures were in use; patient died of peritonitis. Dr. G. Kimball, 2 operations, pregnancy unsuspected; existed in each case about

three months; peritonitis followed each operation. In all, 29 operations were reported, with 24 women and 20 children saved.

Dr. Battey reported 4 cases in which no operation was performed. No. 1, tapped at 6½ months and seven gallons drawn off; patient left in the care of her physician, who failed to repeat the tapping; gave birth to a child at term; felt as if something had given way; died in half an hour after delivery; no autopsy; presumed rupture of cyst. No. 2, delivered at term; no tapping; died of presumed rupture of cyst, shortly after her delivery. No. 3, similar in character to No. 2. No. 4 was examined when about four months pregnant; sound introduced to determine pregnancy, and if it existed to produce abortion; the latter followed, and the patient died in a few days. Dr. Sutton had seen two cases of twisted pedicle within five years. Miscarriage occurred in both, and death followed in two weeks, and ten days respectively. Ovariotomy was performed upon one of them after miscarriage, under the belief that the pedicle was twisted; hemorrhage had occurred to a large amount into the cyst, and the patient died in seventy hours.

Judging from the opinions given in discussion, the sense of the society was in favour of ovariotomy as advocated by Dr. Wilson, an exception being made in cases where the cyst is small and can be carried without special risk from pressure.

Dr. THEOPHILUS PARVIN, of Indianapolis, contributes a paper on *Secondary Puerperal Metrorrhagia*. For convenience he adopts the limit of time given by McClintock, and calls a hemorrhage "secondary" which occurs at any time within the month, except during the first six hours after delivery. He excludes all cases in which the flow results from inversion or rupture of the uterus, and all which are not uterine in origin.

Causes.—1. Alterations of the blood: *a*, Albuminuria; *b*, Purpura; *c*, Malaria. 2. Psychical influences. 3. Direct influences: *d*, Those which prevent uterine retraction; *e*, Those which produce uterine congestion. To the first belong secondary uterine inertia, uterine fibroids, and possibly peritoneal adhesions. Among the causes of increasing uterine congestion are enumerated, metritis and peri-metritis; too early rising and engaging in household duties; too early sexual intercourse; uterine polypi; retained clots, or portions of the placenta or membranes; displacements of the uterus, especially anterior and posterior flexions and versions; constipation of the bowels; distension of the bladder; coughing; aneurism of uterine artery and thrombus of the cervix. *Methods for Relief.*—1. Uterine compression. 2. Compression of the abdominal aorta. 3. Uterine injections: hot water; solutions of salts of iron, or with the addition of chloride of sodium to render them less irritating. 4. Application of cold to the abdomen or vagina. 5. Administration of ergot. 6. Use of quinine. 7. Use of opium. 8. Use of hot baths, two days or more after delivery.

Dr. Campbell objected to the use of perchloride of iron; but favoured that of iodine, using one part of tincture to four of water through a chamberlain's tube. Dr. H. P. C. Wilson had "never been bold enough" to inject iron; had not used iodine; favoured the use of the hand as a curette to rake over the placental site. Dr. Barker had often used persulphate of iron, and had never seen a fatal result such as had been reported by others; should for the future, as safer, prefer iodine and the hot water douche. Dr. Charles Shepard favoured placing the patient on an inclined

plane of 45°, head downward. Dr. Engelmann used a speculum and mopped out the cavity of the uterus under the eye, using cotton pledgets held in dressing-forceps and soaked in perchloride of iron, drawing out the clots with the cotton.

Three Fatal Cases of Rupture of the Uterus with Laparotomy are reported by W. T. HOWARD, M.D., of Baltimore. These three operations were performed by Dr. Howard, in 1868, 1874, and 1879, and appear in outline in the statistical record of the reviewer published in October, 1880. No. 1 had a normal pelvis; was in her eighth labour, three hours, when rupture took place; operation eight hours after rupture; died of septic peritonitis in seven days. No. 2, pelvis small; fourth pregnancy; operation an hour after rupture; died in same time and from same cause as No. 1. No. 3 was in her ninth labour, and was operated upon seventeen hours after rupture; died of shock in eighteen hours—children all dead. Dr. Howard deserves much credit for having published these cases. He seems to have been unusually unfortunate in their results, as twenty-one out of forty-one operations in this country have saved the lives of the women, and the only two ever performed in this city were successful. He regrets now that he had not sutured the uterine rent in case No. 1. He expresses a preference for the silk over the wire suture, but bases his opposition to the latter upon what is known to take place in vaginal wounds, the bent-down wire tending to rise and become perpendicular. This does not apply where the suture is intra-abdominal, as the wire becomes coated with a lymph deposit, and finally encysted, as has been proved by several subsequent examinations. If silk is used, it ought to be pure, and free from sea-island cotton. Pure silk may become absorbed; but cotton is indestructible. Sutures have been used in the uterine wound, in twenty-two Cæsarean operations in the United States. In eight of these, the women recovered. Pure silk, carbolized, and the antiseptic dressing, have been employed with success, quite recently.

Dr. Howard is inclined to recommend the extirpation of the uterus in some cases of rupture, treating the pedicle after the manner of Schrœder, and dropping it in. He states that the reviewer did not give the date and particulars of the Prevôt extirpation case. This was correct at the time he wrote his paper, but the case was then in type, and appeared in October, 1880. His proposal to remove the uterus, like that of Dr. Federico Alessandrini, of Milan, was conceived in 1879, the year after it had been done in Moscow. Since Dr. Howard wrote this paper, the pedicle in Porro cases has been ligated and dropped in several times, but never successfully. Five Porro operations have been successfully performed in order, in the Santa Caterina Hospital of Milan, saving both mothers and children; but all the pedicles were dressed externally. As the operation of laparotomy after uterine rupture in the United States has been more successful than the Porro operation in Europe (33 out of 74), we are not prepared to recommend the Prevôt method, and especially as it unsexes a woman unnecessarily, and adds greatly to the shock.

In a paper on *Occlusion of the Gravid Uterus*, Dr. JOSEPH A. EVE, of Augusta, Georgia, dwells upon the peculiar rarity of this form of dystocia, and quotes the records of several cases by Bedford, Playfair, Ashwell, etc. He reports one case which came under his own observation, in which he relieved the patient in labour by incising the cervix. She subsequently bore a child naturally. The occlusion resulted from the application of nitrate of silver and nitrate of mercury for erosions of the cervix.

We object decidedly to such terms as "Vaginal Cæsarean Section" and "Vaginal Hysterotomy." The true Cæsarean operation is "Laparo-hysterotomy" or "Gastro-hysterotomy." "Hysterotomy" is the operation upon the cervix through the vulva. Gardien (1816) properly separated Gastro-hysterotomy and Hysterotomy, and gave each its special meaning. There have been no less than seven cases of occlusion of the *os uteri* in the United States in which the Cæsarean operation has been performed, saving three women.

Posture in Labour, an Ethnological Study, is the title of a paper by Dr. GEORGE J. ENGELMANN, of St. Louis. It is impossible to do justice to this long article in our allotted space. Since it was presented, two other papers have appeared in print belonging to the same subject, and the series is still incomplete; the whole will form a curious and interesting volume, fully illustrated, bearing evidence of the persevering industry of its author, who has searched the world over to obtain his material. The article in the volume under review contains forty-six wood-cuts, and is made up of facts drawn from 9 European countries; 16 Asiatic; 14 African, and from North, South, and Central America, Australia, and the South Sea Islands; and is especially of interest as an exhibit of the peculiar parturient customs of many of our Indian tribes.

Dr. JAMES R. CHADWICK, of Boston, contributes a paper on *The Hot Rectal Douche*. The author was led to the employment of the rectal douche from observing the benefit of the same plan of treatment in bladder troubles, especially cystitis. The first series of cases presented in the paper were those affected with diarrhœa, either "acute or chronic, characterized by small, frequent evacuations," due to inflammation or irritation of the mucous lining of the rectum and large intestine. The four cases of diarrhœa in group 1 appear to have been soon cured by the douche. Dr. Chadwick, finding the value of the hot douche, very naturally changed from the per-vaginal to the per-rectal mode of using it in pelvic inflammations, as it could be more readily employed, and the fluid would come in more general juxtaposition with the parts involved. The injection of hot water into the rectum enables the physician to apply heat in a favourable manner, as the rectum will retain the water, and if one or two quarts are introduced, keep it in close contiguity with the peritoneum. The diseases enumerated in which he has tried it with benefit are backache and painful defecation, abdominal pains, pains referred to the rectum, pains and burning sensation in the abdomen, and pelvic effusion.

The author uses water at 110°; introduces as large a volume as possible without producing pain; and has it retained as long as possible. The patient is placed upon her side (right preferred), and a fountain syringe containing half a gallon is used, the water being slowly introduced. When she desires to defecate, stop the flow a few minutes, without withdrawing the pipe, and then resume the introduction. In this way the whole large intestine may be filled in some instances. Dr. Chadwick directs generally that the douche shall be taken two or three times a day for one or two weeks; and in some instances four or five weeks where it can be borne.

The Prophylactic and Therapeutic Value of Quinine in Gynecic and Obstetric Practice, is the title of a contribution by Dr. HENRY F. CAMPBELL, of Augusta, Georgia. Dr. Campbell, having practised medicine for a long period in miasmatic localities, has had ample opportunities for testing the effects of quinine in pregnant women, whether in labour, in threatened miscarriage, or where there was no uterine disturbance; in

subjects affected with malaria, in the paroxysmal or non-paroxysmal form; or where entirely free from the influences of paludal poison. From the use of calomel in excessive doses, our Southern colleagues have stepped to that of quinine in large measures, and many of the changes in the belief of the profession of our country as to the therapeutic applicability of this remedy in fevers, inflammations, zymotic diseases, and septic affections, have originated in the discoveries of Southern physicians, whose practice in the use of quinine was at one time regarded as largely empirical. One of the earliest advocates in this city, of the use of quinine in large doses in fevers, as a contra-stimulant, in zymotic diseases and inflammatory affections, was the late Surgeon-General, Clement A. Finley, whose views twenty-five years ago were regarded as wild and visionary, although they were such as are largely believed in at the present day. Dr. Finley had been stationed at Norfolk, Virginia, and probably from experiences and associations there, formed the views he then held. To present in a condensed form the views of Dr. Campbell, we have arranged them in an aphorismic style.

1. The constant use of quinine in malarial districts of the South controverts the belief in its oxytocic properties. 2. Paroxysmal neuroses endanger the prosperity of pregnancy. Quinine should be given to prevent, instead of withheld for fear of producing abortion, as there is far more danger from the association of chills and fever with the pregnant state than from the administration of the remedy. 3. The pains of miasmatic fever often simulate those of pregnancy, and abortions in fever districts will often be found to have been preceded by diurnal or nocturnal headache, pains in the lower extremities, and recurring uterine pains. 4. Paroxysms of a local or general form without fever often threaten the continuance of pregnancy. Malaria may exist in the system without manifesting its presence by the cold, hot, and sweating stages. Cases reported where periodical uterine pains, apparently those of a miscarriage, occurred, but without fever, were promptly relieved by quinine pushed to cinchonism. Several relapses occurred subsequently, in which the effect of the medicine was always the same. 5. Paroxysmal neuroses resembling labour near the end of gestation; *typical case given*, in which there were apparently all the phenomena of the second stage of labour with expulsive efforts, etc., and yet no evidences of uterine action to the touch, the os being unopen, soft, and relaxed. These attacks recurred in a tertian type, and were arrested by quinine, the patient being delivered of twins two weeks later. 6. Paroxysmal neuroses amenable to quinine often disturb and interrupt the normal processes of childbirth. Dr. Campbell says he has never given quinine to a woman in labour at term, either to promote or retard uterine contraction in the first or second stage, but has confined its use to malarial complications present or anticipated. 7. Quinine has been found a valuable preventive of puerperal eclampsia, and a remedy in hysteria, tetanus, and (by the rectum) in infantile convulsions. 8. After labour, quinine acts so as to prevent and control traumatic inflammation. In mammary inflammations the symptoms will often appear of an intermittent or remittent type. 9. Quinine acts by depressing the reflex excitability of the spinal cord. 10. Malaria is believed to increase reflex excitability or produce morbid excitability; hence the therapeutic indication for quinine.

Dr. Campbell administers quinine invariably after parturition, whether a labour at term, a miscarriage, or an abortion, beginning on the morning

of the second day, and pushing it to moderate cinchonism. When the effect is one of nervous excitement, he gives bromide of potassium for its antagonistic effect. Quinine, in some cases, produces alarming heart disturbance with sinking, and in others, attacks resembling urticaria. In such cases, Dr. C. gives bromide of potassium and opium, or substitutes salicine for the quinine. 12. Quinine has been found a valuable remedy in inflamed mammæ, abscesses, uterine tenderness, cellulitis, and tardy involution.

Laparotomy and Laparo-hysterotomy; their Indications and Statistics; for Fibroid Tumours of the Uterus, are described by Dr. C. D. PALMER, of Cincinnati, Ohio. We decidedly object to the second term in this title, as it has already been appropriated by many writers to the Cæsarean section, they preferring the *laparo-* to the *gastro-* of Gardien (1816). The author intends to convey the meaning of excision and not incision; his term should have appeared as laparo-hysterectomy. The successes of a few very prominent ovariotomists have induced them and other operators to perform much more hazardous, and much less promising operations upon the abdominal cavity, especially of women. What has been the actual result in cases where fibroid tumours have been removed from the uterus; or where the uterus itself has been exsected in the removal, it is impossible to determine, as many of the cases have never been reported. Dr. Palmer has presented a statistical table containing 38 of the first class, with 22 recoveries, and 127 of the second, with 62 women saved. Although larger than the tables of his predecessors, his collection by no means represents the whole mortality, as we know of quite a number of cases not included therein, most of which were fatal. With regard to the effect of oöphorectomy upon the growth and development of uterine fibroids, Dr. Palmer is under the impression that it usually establishes the menopause, and in many cases secures the shrinkage of the organ. He gives a table of 20 such operations, with 15 recoveries, and claims that the result was generally a favourable one. No. 1, by Dr. Trenholme, of Montreal, is given as a case resulting in the absorption or shrinkage of this tumour, but Prof. W. H. Byford reported the status of it several years later, and says:—

"That patient is now under my care in the Woman's Hospital of the State of Illinois, where she has been for nearly a year. Her present condition is almost as miserable as it is possible for a patient to be in. She has no regular menstrual hemorrhage; but in consequence of any kind of exertion or great excitement, there is a great congestion, followed by great hemorrhage, so much so, that her condition is often extremely critical." . . . "The hemorrhage is so profuse that the tampon is frequently required to arrest it. The tumour is still as large as it was said by Dr. Trenholme to have been before the operation."

With a risk of death, and an uncertainty of decided benefit, oöphorectomy for the cure of fibroid tumours of the uterus cannot be very strongly recommended to a patient suffering from the disease. It will not do to raise the hopes of the woman too highly; she should be told candidly that the operation offers only a hope of success, as a failure to cure will only tend to injure the reputation of the operator. R. P. H.

ART. XIX.—*A Manual of Histology*, edited and prepared by THOMAS E. SATTERTHWAITE, M.D., of New York, President of the New York Pathological Society, Pathologist to the St. Luke's and Presbyterian Hospitals, etc. In association with Drs. THOMAS DWIGHT, J. COLLINS WARREN, WILLIAM F. WHITNEY, CLARENCE J. BLAKE, and C. H. WILLIAMS, of Boston; Dr. J. H. C. SIMES, of Philadelphia; Dr. B. F. WESTBROOK, of Brooklyn; and Drs. E. C. WENDT, A. MAYER, R. W. AMIDON, A. R. ROBINSON, W. R. BIRDSALL, D. BRYSON DELAVAN, C. L. DANA, and W. H. PORTER, of New York City. 8vo. pp. 478. New York: William Wood & Co., 1881.

IN no department of scientific medicine have the past few years been marked by more progressive strides, and more general development of keen interest than in histology—normal and pathological. While, but a short time since, students in our medical schools knew little or nothing of this important study in a practical sense, now, the almost universal system of laboratory instruction adopted affords opportunities, which are eagerly embraced and fully appreciated, as evinced in the interest shown, and in the steadily increasing number of original investigators, whose contributors mark the beginning of a new era for American scientific literature. To those interested in histology, and especially to those engaged in teaching it, there has been long apparent the need of some text-book, which could be placed in the hands of students with more satisfaction than any of those ordinarily in use. In such an ideal text-book, we should find concise and accurate descriptions of tissues and organs, illustrated by faithful drawings, and accompanied with explicit directions of the best modes of obtaining, preparing, and examining the structures—a book at once full enough to guarantee adequate information to the novice without being tedious to the advanced student, and, at the same time, containing sufficiently complete descriptions, with succinct accounts of the most recent investigations, to claim the careful perusal of the experienced histologist, without presenting that diffuseness so confusing and disheartening to the beginner.

The task of the production of a volume supplying this long-felt need, our author and his associates have taken upon themselves. That the satisfactory completion of such a work is beset with difficulty, we think all must admit; we feel, therefore, that our authors are to be congratulated on the degree of success which their united efforts have achieved. Dr. Satterthwaite, as stated in the preface, has wisely availed himself of the coöperation of a number of gentlemen, many of whom have given special study to the investigation of the organs, a description of whose histology they contribute

The first nine chapters, discussing apparatus, general instruction, methods, and the simple tissues and structural elements, are contributed by Dr. Satterthwaite. Chapter I., treating of apparatus, methods of work, lenses and general considerations, is marred by several inaccuracies: the method of determining the magnifying power of a lens, by placing a rule alongside of the stage-micrometer, and thus comparing the scales, yields but approximate results, strict accuracy being hardly obtainable, especially with high powers, where the slightest discrepancy represents, perhaps, a difference of a hundred or more diameters, in some cases a matter of no little moment; the better method of projecting the lines of the stage-

micrometer by the camera, afterwards applying the rule, is to be preferred. The length of the standard tube when in use is assumed by English and American opticians as ten inches, or twenty-five centimetres; "twenty-five centimetres, or about *eight* inches," as stated, being misleading as well as incorrect. In the enumeration of the desirable qualities of objectives, the third quality, "all objects in the field should appear with equal distinctness, whether at periphery or centre," is already included in the first—"it should have no spherical aberration." In the next few lines we are told "the former (penetration) depends upon a *large* angle of aperture," a statement in direct opposition to the views generally accepted. As a test of high lenses, a valve of Pleurosigma Angulatum is recommended, the exhibition of the three seats of markings, by direct light, being considered a good test for 500 diameters; in our own experience, for the definition of lenses designed for histological work, there are no tests more admirable than the salivary corpuscle, together with scales of genuine English podura. When we find, in the next paragraph, Nobert's test-plates recommended to test the *magnifying* power of lenses even more carefully, we presume that by typographical error, "magnifying" has been substituted for the proper word "resolving." On concluding this chapter, it is to be regretted, that we find no mention of, or description of the method of using, that very useful accessory, the camera lucida. This we cannot fail to consider an unfortunate omission, as, in a book designed especially for students, full instruction as to the best manner of producing accurate drawings of microscopic objects is eminently desirable; we would have been glad to find a page devoted to a full explanation of the mode of using the camera, with an earnest recommendation to draw all interesting objects whenever practicable.

The second chapter is devoted to the various methods of preparing tissues for examination, including hardening, section-cutting, staining, and injecting; the section on stainings is especially complete, giving the formulæ for making, and directions for using, all the most important stainings employed. It would have been desirable to have the effect of variations of the strength of the fixing or bleaching acid solutions considered more at length, as all gradations of the stainings with the borax-carmine solution may be thus produced. The section following furnishes some excellent formulæ for injecting fluids, and contains valuable hints upon the process in general.

In the succeeding chapters, with which the descriptions of the tissues begin, we have presented a very satisfactory account of the blood; the behaviour of the cells when treated with the various reagents, as solutions, gases, heat, and electricity, and the mode of viewing the circulation being given, to which are added detailed accounts of the methods of counting the corpuscles, and of using the *hæmochromometer* of Malassez and Verick, by means of which "the richness of the blood in hæmoglobin, and the maximum amount of oxygen which it can absorb, may be determined." While giving the reaction of blood with the indifferent salt solution, the peculiar shrinking or crenation of the corpuscles in stronger saline solutions, as concentrated urine, has been omitted, the knowledge of which point is sometimes of practical import. The epithelia are next considered, descriptions being given of the three principal varieties,—squamous, ciliated, and columnar, to which is added a synopsis of the later views concerning the intimate structure of these cells. In the account of the squamous cells from the mouth the salivary corpuscles are

casually mentioned, and we read, "in size they closely resemble the white corpuscles of the blood, but, as a rule, exhibit no amœboid motion; the white globules, on the other hand, rarely have any Brownian movement." That the so-called "salivary" corpuscles are morphologically, at least, identical with leucocytes, which have imbibed fluid of less density than the liquor sanguinis, we think there can be little doubt. Dr. J. G. Richardson, some years since, first called attention to the fact that by treating the salivary cells with saline solutions, they gradually lost their "salivary" characteristics, and finally assumed the appearance of normal white blood corpuscles, even to the marked amœboid movements; on the other hand, by irrigating a slide of blood with filtered saliva containing no cells, we may observe the leucocytes to cease their amœboid motion, gradually become spherical, increase in size, present one or more nuclei, and finally take on the Brownian movement, in short, present themselves as veritable "salivary" corpuscles. Whether these latter are solely transuded leucocytes, whose migration has been aided by some local congestion of capillaries supplying glandular tissues, depending perhaps on some special nervous stimulus, or whether they are derived from the submucous tissue, or from proliferation of the cellular elements of the glands, seems to be still undetermined, but that morphologically, at least, they are identical with the leucocytes or lymphoid cells, seems to admit of but little doubt.

The next four chapters are devoted to the consideration of the "connective substance group," embracing excellent descriptions of the various varieties consisting of mucous or gelatinous tissue, adenoid, neuroglia, fat tissue, fibrous tissue proper, corneal tissue, intermuscular tissue, tendon, elastic tissue, bone, cartilage, enamel, and dentine. As our author truly states, "just at the present time the histology of connective substances has an important bearing on many points that relate to inflammation, degeneration, and the development of certain new growths, and it is, therefore, desirable to have a clear conception of them;" it is more than probable that, with the advance in our knowledge of pathological processes, this class of tissues will assume a position of increasing importance, and it is, therefore, gratifying to find the student provided with so clear and full an account of these structures as here found. In discussing the mode of development of fibrous from embryonic tissues, our author expresses himself as tending to the conviction that the fibrous tissue arises from the soft, gelatinous—homogeneous—material, formed by the embryonic cells themselves and in intimate proximity with them, "by a process of fibrillation inaugurated by the presence and under the formative action of the connective-tissue corpuscle," citing the result of pencilling macerated specimens, by which the corpuscles themselves may be partially or entirely removed, while the areas showing the fibrillation still remain, and are without nuclei. While the observations already recorded by several observers make the development of fibrous tissue by this (the "indirect") mode highly probable, yet, as stated by Klein, that the mode of the direct transformation of the connective-tissue cells into the fibres participates also largely into the development of this form of connective substance, seems certain. In his description of the adenoid form of this group, our author takes exception to the views of "Klein and other histologists" as to the reticulum being formed by the anastomosing processes of stellate cells, holding, on the contrary, "that adenoid tissue does not generally consist of a network of branching corpuscles, as has been claimed, but

rather of a network of fibrous cords on which the corpuscles are superimposed;" regarding the views of Klein as stated in his "Atlas of Histology" (p. 155–6) there appears to be no issue, since they accord in the main with the description just quoted. In concluding Chapter V., attention is called to the fact that in the light of more modern investigation and study, we can no longer consider the endothelial coverings of serous surfaces as modified epithelium, but that now we must turn to the connective substances to find their true interpretation—modified connective-tissue cells. The three following chapters treat of the various forms of cartilage, bone, and teeth, containing carefully prepared accounts of the mode of development and growth of the last two.

Succeeding these, the general histology of the nervous system is presented, embracing descriptions of the three classes into which nerves are divided—myelinic or medullated, fibres of Remak, and ultimate fibres; together with the most satisfactory methods of preparation and examination, an account of the various ganglionic centres, and, finally, an enumeration of the modes of termination, under which we find—by undivided or free endings; by end bulbs; by terminal loops; in corpuscles; by networks; and, finally, in special apparatus; our author states that, on two occasions, he has seen the nerve fibre pass through the Pacinian body, resuming its medulla on its exit, which it had lost on entering the corpuscle.

Chapter X., devoted to muscular tissue, is contributed by Dr. Dwight. The section discussing the striated variety is especially interesting, as expressing the author's convictions regarding the true structure of this tissue. After describing the appearances of striated muscle, as ordinarily seen, the writer presents an interpretation of these as found in the study of the striped muscle of the water-beetles, his conclusions being especially based upon observations on the living muscle of the detached legs of the Gyrinus (an aquatic beetle commonly known, according to our author, as the "lucky-bug"), and agreeing, in the main, with those of Schäfer. According to these conclusions, the structure of striated muscle is briefly as follows: there is a transparent, semifluid, ground substance, which is the contractile element; there being placed transversely, at certain intervals, a double row of minute granules or spherules, the refraction of the light from which causes on either side of them the appearance of a bright band, in the middle of which, on account of a smaller number of rays passing through, we have the appearance of a dark line—corresponding to the "membranes" or septa of Krause, as usually accepted. In addition, our author doubts the existence during life of the longitudinal striation or fibrillation, regarding these appearances as the results of reagents or post-mortem changes.

In the following chapter, Dr. Wendt has furnished us with an admirable description of the vascular system, including the mode of development of the capillaries, to which is appended mention of those peculiar structures, the coccygeal and intercarotid glands. After carefully pointing out the characteristics of the vascular endothelium, attention is directed to the small areas, usually without nuclei, which are found between the other endothelial plates, known as the "intercalated areas" of Auerbach. In opposition to the view that these are strangulated cells, our author considers that "it is more logical to regard them as the remnants of an incomplete endothelial desquamation, a process which is of physiological occurrence throughout the bloodvessels." While he, thus, does not admit the existence of stomata, as described by Cohnheim, he finds the explana-

tion of the well-known phenomena of migration in the permeable, protoplasmic nature of the endothelial tubes; the suggestion is also offered, that the remains of these desquamated cells, appearing in the blood, have supplied the material for the "*microcytes*," "*hæmatoblasts*," etc., of various authors. In accord with the views already stated, the small so-called "granulation" bodies found beneath the endothelium of vessels, are considered "as matrix cells for the regeneration of desquamated endothelium," this conclusion being deduced from the observation that similar bodies appear in large numbers in the vessels of young animals, and very closely resemble germinating endothelium; while they shrink up with increasing age of the animal, the permanency of some of them, at least, is rendered highly probable by their sudden reappearance in certain pathological processes. The assertion of Beale, as to the constant presence of ganglionic cells in the vascular nerves, our author does not accept, since, in his experience, their presence is exceptional.

Dr. Birdsall has contributed a carefully prepared chapter concerning the lymphatic system, in the introductory remarks to which he writes, "it is still in this direction that we are to look for advancement in pathological histology, for there can be no doubt that heretofore too little attention has been given to the lymphatic system, both in its histological details and in its topographical anatomy." Following the consideration of the present views regarding the structure of this system, as well as its relations to the connective tissues, we find a general description of the lymphatics, succeeded by more detailed accounts of those of special localities, together with valuable hints as to the most successful methods of obtaining satisfactory specimens for study. The intimate structure of these vessels is considered, and the views of Ranvier, as well as those of Klein, concerning the real nature of the *true* and *false* stomata, are presented, the chapter concluding with an account of the lymphatic glands, with directions for obtaining their satisfactory injection.

The liver and its appendages, and the kidney supply the text for the next two chapters, being written by Dr. Mayer. The histology of these organs is given in a satisfactory manner, according, in the main, with the views generally accepted. In order to demonstrate the biliary capillaries, the method of natural injection by a saturated solution of sulph-indigotate of sodium is strongly recommended, full details of the process being added. To the question, "Do the bile-capillaries possess walls of their own?" an affirmative answer is given, this conclusion being deduced from the examination of organs prepared by the above method of natural injection, in which these capillaries are said to appear, when seen in transverse section, as minute dots, between the hepatic cells, surrounded by a delicate circle, representing the homogeneous wall. In the chapter devoted to the kidney —one of the best in the volume—it is gratifying to find a confirmation of the observations of Heidenhain, as to the existence of the striation or "rods" of the epithelium of the tubules; it is to be remarked, however, that these, as figured by Heidenhain, appear more delicate and closely set, than as represented in the present chapter. To bring these structures clearly into view, our author directs the cortex of the kidney of a dog or rabbit, after being cut into small fragments, to be immersed in a five per cent. solution of neutral chromate of ammonium, for twenty-four hours or longer. Natural injections by the method (Heidenhain's) already mentioned are advised, as by this means the presence of the "rod" epithelium is also beautifully shown, together with the fact that by these cells alone is the indigo salt excreted.

Chapters XV. and XVI., contributed by Dr. Simes, furnish a concise and excellent account of the histology of the generative organs, both male and female. In treating of the development of the spermatozoa, the author has availed himself of the admirable description given by Klein, which is quoted in full; we regret that no mention is made of the interesting observations of Gibbs concerning the structure of these elements.

The minute anatomy of the respiratory tract is from the pen of Dr. Westbrook, and includes a full description of the organs usually comprised under this heading; in describing the alveolar epithelium, as seen in silver stainings, the darkly coloured, so-called pseudostomata are explained by the hypothesis of Klein—that they are the deeply-stained processes of branched connective-tissue cells, lining the lymphatics, which protrude between the epithelial cells.

Chapter XVIII. treats of the skin and its appendages, and is written by Dr. Robinson. In opposition to the generally admitted view, this observer believes the "prickle" cells of the rete Malpighii to be connected by filaments, which are represented by the *light* bands seen between the cells. The dark lines, which are usually interpreted as being the delicate connecting processes, are considered as *spaces* between the true connecting fibres, these being filled with an albumenoid substance, and forming a system of minute channels for the nutrition of the epidermal cells. We also find mention of the "fat-columns" of Warren—a special account of which is found, however, in a later chapter. The opinion is expressed, when describing the "tactile" corpuscles, that in these the nerve does not terminate, but passes on into the rete Malpighii.

Dr. Amidon, in Chapter XIX., supplies a concise description of the central nervous system, including spinal cord, medulla, olivary body, cerebellum, and the most important centres of the cerebrum. A means of determining which surface of transverse sections of the cord we may be examining is suggested, depending upon the fact that the fibres forming the anterior roots pursue an obliquely descending course through the anterior columns; thus, in transverse sections with the upper surface towards the observer, the central ends of these fibres are nearer the eye than the peripheral ones, which are slightly beyond the focus, in order to clearly see which, a change in focal adjustment must be made, giving an apparent peripheral motion to the bundle of fibres.

In the chapter devoted to the organ of vision, Dr. Williams gives a clear but concise account of the structure of the various tissues going to form this complex organ. While describing the cornea, he expresses himself as doubting the integrity of the anterior and posterior elastic membranes, as distinct and separate structures, considering them as merely condensations of the substantia propria; as a means of demonstrating the arrangement of the various bundles of fibrillæ, the method by interstitial injection of a solution of argentic nitrate, we consider preferable to that by inoculation as given, as by the former a most striking picture can be readily obtained, showing, at the same time, the relation of the corneal spaces to the ground substance. An account of the system of lymphatics of the eye, with mention of the intimate relation existing between the anastomosing spaces and the perivascular and perineural channels, as found in the cornea, would have been desirable, since, it is more than probable, an extended knowledge of the pathological processes occurring in this organ will establish the fact of a greater participation by this system than is generally admitted.

According to custom, the auditory apparatus follows, the authorship of which belongs to Drs. Whitney and Blake. Pursuing the natural order, we find descriptions of the external, middle, and internal ear. For the study of the membranous labyrinth, the organs of certain fish—pike, perch, or cod—are recommended, and practical instructions for successful examination added, with a description of the structure as there found; this is followed by a consideration of the cochlea, including the organ of Corti.

Two chapters are devoted to the nasal fossæ, pharynx, tonsils, mouth, and tongue, by Dr. Delavan, embracing the olfactory region and special organs of taste. With the descriptions of these tissues, we naturally anticipate an account of the salivary glands, but in this we are disappointed; for, while the mucous and serous glands of the oral cavity are noted, those of much greater importance are ignored, and, in fact, careful search throughout the entire volume reveals the rather remarkable fact that all mention of these highly interesting structures has been omitted.

The alimentary canal forms the second contribution of Dr. Wendt to this volume. Under this heading we find œsophagus, stomach, small and large intestine, and rectum, the descriptions according with the views generally accepted at the present time; attention, however, is called to the still unsettled state of our knowledge concerning the true nature of the "parietal" cells of the peptic glands, and their relation to the chief cells. The recent conclusions of Edinger are presented, by whom these parietal cells are considered to be direct developments from the chief cells, and, in addition, the still later views of Stöhr, who maintains that they are those portions of the mucoid cells, made up of unaltered protoplasm, which have not undergone mucoid degeneration.

In a rather heterogeneous group—unless our ignorance as to their true nature be taken as the family tie—the consideration of the spleen, pancreas, thymus, thyroid, and pineal glands, and pituitary body forms the contents of Chapter XXV., by Dr. Dana. We here have presented an excellent description of the splenic structure, with hints as to the best methods of preparation, followed by concise accounts of the remaining organs.

The title of the succeeding chapter—"The Thick Cutis Vera"—presents, we believe, a novelty, as regards its description as a distinct organ. According to the author—Dr. Warren—this structure resembles closely a tendinous expansion, being composed of a network of bundles of fibrous tissue, among and covering which are flat connective-tissue cells. This structure reaches its highest development on the posterior aspect of the body, on the back and shoulders, attaining a thickness of over 5 mm. We next find an account of a series of structures whose existence was first pointed out by our author, to which he has applied the name of "fat-columns," or "fat canals;" these consist of nearly vertical clefts or slender columnar spaces extending through the deeper and middle layers of the cutis from the layer of adipose tissue found beneath the latter, and terminating at the bases of the follicles of the lanugo or downy hairs; their spaces are filled with adipose tissue, thus suggesting the name already mentioned. The number of these "fat-columns" corresponds to the number of the follicles of the hair, the latter being seemingly necessary for their appearance; the lymphatics of the cutis were found to correspond to the situation of these clefts; for a detailed description of these structures, together with their relations to the well-known elements of the skin, we must refer the reader to this very interesting chapter, where, in addition,

will be found some suggestions regarding their relations to pathological phenomena.

The urinary excretory passages and the supra-renal bodies form the subjects of Chapter XXVII., by Dr. Wendt, who, in conjunction with Dr. Porter, also contributes the concluding article of the volume, on the mammary gland. In this very instructive contribution, we find the peculiar views of Creighton and others, regarding the mode of the secretion of milk, considered at some length, but space forbids us more than mentioning the conclusions of our authors concerning this interesting point. These are, that the evidences of a destruction of the epithelium are not convincing, while direct observation tends to demonstrate that fat drops may be extruded by the force of the vital contractions of the protoplasm of the cells, in addition to which, the partial rupture of the cell-walls liberates an additional portion of the oil droplets, but, in neither case, is there any impairment to the vitality of the cells, and, that by these continuous processes of discharge of the fatty particles are the phenomena of lactation maintained.

During the perusal of this volume, it has been with no little interest that we have noted the comments of the various contributors regarding the intracellular networks of such constant occurrence as described by Klein, Flemming, Schleicher, Heitzmann, and others; while usually these observations have been mentioned, none of our authors, we believe, have confessed allegiance to these views. That appearances suggesting such structure continually are seen, all must admit; the fact, however, that special processes are necessary for their satisfactory demonstration, renders the suspicion that they are artificial productions by, perhaps, the coagulation of the albumenoid cell contents still more forcible, the coagulation of albumen frequently resulting in the most remarkable arrangement of apparent fibres into networks and striations. According to Klein, the molecular motion visible in leucocytes, on their imbibition of water, corresponds to a breaking up of the intracellular network, which would necessarily imply beginning disintegration; but, under proper treatment, as has been demonstrated in the "salivary corpuscles," these cells leave off the Brownian movement, and once more assume their amœboid—vital—changes.

In the matter of illustration—so important in a text-book of this kind—there is room for improvement; while some of the sections are fairly illustrated, in others the representations are meagre, the deficiency being especially apparent in those portions devoted to nervous tissues and their endings; an illustration of the spinal cord, in transverse section, under medium amplification, would improve the corresponding description; another defect concerning the illustrations is the very general omission of the amplification under which the drawings were taken; this matter, of such common neglect in books, is one which, whenever possible, should receive careful attention. That in a volume emanating from American sources, the old familiar and oft well-worn illustrations should be replaced by original ones taken from actual preparations, as far as possible, is eminently desirable, but the impracticability of such an undertaking, under existing circumstances, is appreciated; we are compelled, therefore, to be content to await the solution of the problem of the productions of illustrations, at once satisfactory and inexpensive.

The arrangement of the contents would be much improved, both as regards convenience and system, were the chapters grouped according to

the relations between the organs; thus, the description of the "Thick Cutis Vera" should be found succeeding that of the skin, and not separated from it by a gap of seven chapters. Again, the urinary excretory passages find their natural positions as following the kidney; it is usual, we believe, to associate the mammary gland with the female generative organs.

In conclusion, the authors are to be congratulated on the production of so satisfactory a manual—a book, although in some respects admitting of improvement, which, we doubt not, will find a ready welcome from all workers in this department, as being a trustworthy and valuable epitome of the subject, according to the light of the most recent investigations, and as being by far the best English text-book, as adapted to the wants of the student and busy practitioner; as such, we can heartily recommend it.

G. A. P.

ART. XX.—*Columnæ Adiposæ. A Newly-described Structure of the Cutis Vera, with its Pathological Significance in Carbuncle and other Affections.* By J. COLLINS WARREN, M.D., Instructor in Surgery, Harvard University; Surgeon to the Massachusetts General Hospital. 8vo. pp. 78. Cambridge: Riverside Press, 1881.

THIS little monograph of seventy-eight pages contains a large amount of original work, both in histological and pathological directions, and calls attention for the first time to certain formations in the skin that are found in the healthy human organism and have special interest for anatomists and surgeons. It seems strange that after all the elaborate and minute studies on such a comparatively simple tissue as the skin, dermatologists should have so neglected the cutis vera of the back, which appears to differ in many respects from the cutis in other situations. And this is the more singular, as Dr. Warren has shown conclusively, that the appearances he describes are often plainly visible to the naked eye. This cutis vera, he tells us, is often like a veritable hide and much thicker than in many pachydermatous animals. It is, indeed, a sort of aponeurosis sending downwards a series of long and branching fibrous prolongations. These pierce the subcutaneous fat and combine to form a compact, intricate network. This peculiar web of interlacing bands is often observed to pin down fatty tumours in the dorsal region and check the surgeon if he attempts to "shell them out." This portion of the skin is also devoid of the usual papillary elevations, while the delicate lanugo hairs are seen proceeding from little pits sparsely scattered over the surface. The corresponding follicles also have little depth, not extending through the several layers, while each one is met from beneath by the *fat canal* or *column*, whose axis is directed somewhat obliquely to that of the follicle.

These fat columns, fat canals, or spaces (*columnæ adiposæ*), are clefts or cylindrical spaces in the skin, each about four millimetres long, and containing, except in quite lean people, a large amount of adipose tissue ensheathing bloodvessels, lymphatics and the secretory and excretory portions of the sweat gland. At about the middle of the canal, lateral passages proceed, bearing some resemblance to the extended arms of an old and gnarled trunk. When the fat tissue is absent its place is taken by connective tissue, in conjunction with the structures already mentioned. Canals of similar character, though much less marked, exist upon the

shoulders, arms, breast, abdomen, and lower extremities. They are also found in fœtal and infantile life, and can be detected in some of the lower animals, as the dog and pig.

Their special physiological function is not thought to be very plain, though the author observes, that they may greatly facilitate the motion of the hair shaft with which they are in such close connection. Since, according to Biesiadecki, each lanugo hair lies flat, while at rest, as soon as the erector pili muscle contracts, erection would be hindered by the resisting nature of the dense and inelastic skin were not, as is the case, each follicle provided with an elastic cushion, into which it may retire while the shaft is being erected.

Having in view these anatomical considerations, Dr. Warren has found that they also throw light upon some pathological conditions that have been obscure. The common dorsal carbuncle is one of these, for its cribriform surface and honey-combed interior have long been a target for many unsatisfactory speculations. The following successive changes are those that Dr. Warren has observed. At first, large collections of connective-tissue corpuscles are found stored in the subcutaneous connective-tissue; then, in the central portions these bodies are seen to have made their way into the fat canals; still later the lateral branches have become filled, until at length the whole cutis vera is infiltrated by networks of corpuscles, the superficial layers only remaining intact. As, little by little, the collections in the columns become larger and more spherical and liquid, the hair follicles and muscles become absorbed, until finally the hair-shaft is pushed outwards by the rise of the pustule. This description is a mere sketch of the changes, which, to be properly appreciated, should be read in the concise language of the author.

Altogether, this little monograph is a model in its way, showing how well-directed histological studies, prosecuted under sound and thorough methods, can even now discover new facts of physiological and pathological value that could never have been appreciated without the intervention of the microscope. T. E. S.

ART. XXI.—*Lectures on the Diagnosis and Treatment of Diseases of Chest, Throat, and Nasal Cavities.* By E. FLETCHER INGALS, A.M., M.D., Lecturer on Diseases of the Chest and Physical Diagnosis, and on Laryngology in the Post-Graduate Course Rush Medical College. 8vo. pp. viii., 437. New York: William Wood & Co., 1881.

THE contents of this volume comprise the course of lectures delivered by the author in Rush Medical College, Chicago; together with some brief outlinings of the character, symptoms, diagnosis, and treatment of the various morbid processes to which the lungs and pleura, heart and aorta, larynx and trachea, and the pharynx and nasal passages are liable. While properly disclaiming originality of matter in his text, save for a few records of personal observation, the author claims the exercise of considerable discrimination in presenting the relative importance of the signs of the affections discussed.

The language employed by Dr. Ingals is clear and perspicuous, though marred here and there by reiterations, which, however essential in the lecture-room, are hardly appropriate for retention in the published volume.

The diagrams illustrating percussion and auscultation are good and clear. Although a number of instruments are figured which are rarely seen elsewhere than on the lecture-table, there is not a great excess of this sort of material. The illustrations of normal and diseased structure, original and selected, are commendable throughout. An appendix of formulæ and dose-lists completes the text, which is followed by a copious and satisfactory index.

In the delivery of courses of lectures, too much or too little prominence is, in any institution, liable to be given to subjects which receive more equable consideration in systematic treatises; this depending greatly upon the immediate requirements of the class for which the lectures are prepared. Hence it would be hypercritical to allude more definitely to a great disparity of attention displayed in the discussion of quite a number of subjects, as, for example, phthisis, hypertrophy of the heart, and laryngoscopy.

Save in a very few topics, the medical student will not be led very far into details in studying this conspectus, for such it really is, but at the same time, and which is much to the point, he will not be led astray.

In bringing within one pair of book covers a concise epitome of affections of the chest, and the entire respiratory tract, Dr. Ingals has recognized the interdependent relations of a group of anatomical regions falling together naturally both in histology and in pathology. His volume aims thereby at an objective completeness which has not hitherto been attained, to our knowledge, in any single work on physical diagnosis, or on diseases of the chest and air-passages.

In this respect it is to be commended to the advanced medical student, undergraduate or postgraduate, as may be, as a desirable guide towards a comprehensive view of a special and definite line of study; the precursor, perhaps, of a legitimate special practice equally definite in the scope of its ramifications. J. S. C.

ART. XXII.—*On the Construction, Organization, and General Arrangements of Hospitals for the Insane, with some Remarks on Insanity and its Treatment.* By THOMAS S. KIRKBRIDE, M.D., LL.D., Physician-in-Chief, and Superintendent of the Pennsylvania Hospital for the Insane, at Philadelphia, late President of the Association of Medical Superintendents of American Institutions for the Insane, Honorary member of the British Medico-Psychological Association, etc. Second edition. 8vo. pp. 320, with revisions, additions, and new illustrations. Philadelphia: J. B. Lippincott & Co., 1880.

THIS volume brings before us the very latest results of the studies of a gentleman who, for more than forty years, has given special attention and earnest study to the subject of hospital construction in all its different phases, and, with a fondness for architecture and a special aptitude for all matters connected with the construction of institutions of the character described in the book, he has combined a caution and ripeness of judgment which will commend his observations to all men who are earnestly seeking to know the very latest and best plans for hospitals for the insane, and for their proper organization and management. When the first edition appeared, twenty-six years since, a distinguished alienist, in a review in this

Journal, characterized it "as the best and most nearly perfect work of the kind ever produced," and this edition is an improvement on that, in the more elaborate plans, and in the fact that the author has had ample opportunity to verify his conclusions, and to add whatever may, since that time, have appeared to add force and conviction to his conclusions; and that these conclusions are highly valued and of the greatest interest and importance, may be evidenced by the fact that hospitals, in accordance with these plans, have been erected in all sections of the country, from the extreme northwest to the southeast, and they have been found most admirably to answer the purpose of their erection, and any departure from these plans has been found to be attended with trouble in proportion to the extent of the depa.ture.

To any one, therefore, anxious to inform himself on the construction and organization of hospitals for the insane, no book in the language will give so much valuable information of a character which can be thoroughly relied upon as correct and not likely to lead into any errors. In these days, when certain classes of men give currency to the notion that experience is not to be taken into account when the plans and construction of a hospital for the insane are under consideration, such a work seems eminently needed to correct just such ridiculous assertions, to show just what is required, and exactly in what manner that requisition may be carried into effect with the greatest certainty of success, and in the most economical manner.

While it might be regretted by some that the author could not have given his views more in detail on many of the subjects treated in the opening chapters of the volume, for which he is so eminently qualified by the clearness and breadth of his views on those matters, they cannot fail to see, in what he has said, the convictions of a long and varied experience expressed in that lucid style so characteristic of all the author's productions. So much has been said recently on "home treatment" of the insane, that we feel constrained to quote in full the author's remarks on that subject.

"The general experience seems to show that a very large proportion of all the insane are treated more effectually, and far more economically among strangers, and in well-managed institutions specially provided for their treatment, than in their own homes and surrounded by their families and by familiar scenes and associations.

"Much as has been said in commendation of 'home treatment,' and 'family treatment,' it is not to be forgotten that these are commonly tried and fail, before the idea of removing a patient to an institution is seriously discussed. The great danger in unduly protracting these efforts at home, is that the best period for successful hospital treatment is lost, and that what was recent in its character, becomes chronic, with all the diminished chances of recovery connected with this latter condition.

"The history of 'home' treatment before the establishment of hospitals is one of the saddest records of inhumanity and cruelty to be found anywhere. It was the discovery of this state of things, and the plain unvarnished recital of what was found by benevolent women and men, that led to the establishment of most of the State and government hospitals for the insane, which now do so much honor to the country, and give such blessings to the afflicted and their families.

"Very often this simple change from home to an institution, seems to be of itself sufficient to secure the beginning of convalescence, and not unfrequently the improvement in behaviour and conversation is, from the first, most remarkable.

"As the insane generally cannot be treated successfully, nor properly cared for in private houses, very clearly they cannot be in ordinary hospitals, almshouses, nor in penal institutions. The only mode then, of taking proper care of

this class in a community, it is obvious, as all enlightened experience shows, is to provide in every State just as many special hospitals as may be necessary to give prompt and proper accommodations for *all* its insane, to cure those that are curable, to give every reasonable comfort to those that are not curable, and to prevent their becoming worse—and what is of very great importance, hardly to be overestimated—to protect their families and the community from the acts and influences of irresponsible and often dangerous persons.

"The dangers incident to insane persons being at large are much greater than is commonly supposed. Not a week, scarcely a day, indeed, passes without the public press containing the details of some occurrence, resulting in loss of life or serious injuries to individuals, or destruction of property from the neglect of proper care and supervision on the part of their friends or the public authorities, of those who had become insane and irresponsible for their actions. Very many of the cases of suicide that are reported very clearly belong to this class, and of these a large proportion, there is good reason to believe, were curable if their cases had been understood and properly treated. It is worthy of note, too, that many of these acts, even those of peculiar atrocity, are often committed by individuals who, with all their obvious mental infirmity, had previously been regarded as perfectly harmless. This fact shows the importance of proper provision being made for the prompt care and treatment of all classes of the insane, as well as the danger of allowing persons bereft of their reason and not accountable for their doings, a freedom, which only subjects them and others to risks that benefit nobody."

There is another point from which this subject may be viewed which does not seem to us to have received that attention which its importance demands, the injury to the mental and moral character of the children in any family, by the constant sight and hearing of the conduct and language of an insane person, particularly should that person be one whom they have been accustomed to obey or look up to for advice or counsel. It is a matter of the most common observation that the moral sense and character of an insane person is that which first fails in mental disorders, so that the language and conduct are the exact reverse of that of the individual in proper health.

The imitative character of children here finds, unfortunately, ample exercise, and no one needs be told that they will take advantage of the opportunity. If, as has been stated on good authority, the mental condition of the population of the commune of Gheel, in Belgium, is greatly inferior to that of the surrounding communes, it is clearly to be attributed to the constant association for more than two hundred years with the different classes of the insane, and the impressions produced by that constant association. All observation teaches that the downward tendency is much more readily yielded to than the effort is made to rise, and this can be verified very frequently in every community.

The limits assigned will not allow a discussion of this and several other equally interesting questions, which the opening chapters of the volume bring before us. The chapters on the proper provision for the insane and the mode of securing hospitals with the appointment of the building commissioners are all eminently just and practical.

A recital of the mistakes which have been made in the selection of the sites for different hospitals would be extremely amusing did not the consequences in the way of infinite trouble and expense to all concerned in the after management make it too serious. It seems incredible that men remarkable for their shrewdness and management in other matters should have committed such egregious blunders as have been committed in the selection of the sites of many hospitals, and such can only be accounted for from the fact that they did not give that careful attention to the

requirements of the location of a hospital for the insane which its great importance demands. Tens of thousands of dollars might have been saved in the construction, and in the subsequent management of the hospital, had a few plain facts, laid down in this volume, been carefully and thoroughly considered before the selection of the site was made.

We may mention only two, the supply of water and proper facilities of drainage, as ample justification of the charge. Many commissions seem to have entirely overlooked the fact that the supply of water for all purposes about such an institution should be practically unlimited, when they selected sites where the supply was limited to a few thousand gallons, and the expense subsequently incurred could be counted only in tens of thousands of dollars. As to drainage, there were matters which might offend delicate sensibilities, as they would certainly afterwards give great offence in the sickness, annoyances of various kinds, and great expense required to make proper disposal thereof.

The plans given in the book are of the most approved character, and have received the cordial sanction and unqualified approval of men of experience and character in all sections of the country, combining as they do so many points of excellence in general arrangement, ease of supervision, economy of management, and facilities for everything required to be done in such a building. It is freely admitted that some persons have thought these plans too elaborate, and that they require too great "an aggregation" of the patients, and we are treated to dissertations on the necessity of different plans where greater "segregation" can be effected.

We are free to acknowledge, after having read nearly, if not quite, all that has been so lavishly printed, that we fail to see one advantage to the inmates from such plans, and could name very many disadvantages. It is certainly a principle which every right-minded man will admit, that commissioners for the erection of hospitals or any other public buildings have no right to try experiments on matters of doubtful and disputed expediency with money which has been raised by taxation, and of which they are made, for the time, trustees, and we believe the principle extends also in its scope to applications made for money to be expended for such purposes.

No community will object to a careful and judicious expenditure of money in the erection of buildings designed for public use, particularly in hospitals for the insane, if they see that the funds are applied to the purpose for which they were designed, in an economical manner, and not to the advantage or pecuniary profit of any man or set of men.

"The size of the building, and the number of patients having been determined, its form and general arrangements will next require attention; and no plan, however beautiful its exterior may appear, nor how apparently ingenious its interior may seem, should ever be adopted without, as already suggested, having been first submitted to the inspection and having received the approval of one or more physicians who have had a large practical acquaintance with the insane, and who are thoroughly familiar with the details of their treatment, as well as with the advantages and defects of existing hospitals for their accommodation. So different from ordinary buildings or other public structures are hospitals for the insane, that it is hardly possible for an architect, however skilful, or a board of commissioners, however intelligent and well-disposed, unaided to furnish such an institution with all the conveniences and arrangements indispensable for the proper care and treatment of its patients. Nothing but a practical familiarity with what is required can do this. All recent experiments in planning hospitals without consulting experts, or asking their opinions before the adoption of the plan, as should be expected have proved failures. No desire to

make a beautiful and picturesque exterior should ever be allowed to interfere with the internal arrangements, any more than the wish to have an elevated and commanding site should be permitted to compel the provision of costly roads, and the expense and annoyance of having everything in all future time carried to its great elevation; the interior should be first planned, and the exterior so managed as not to spoil it in any of its details."

All the chapters which treat of different points in the construction and arrangements of the various portions of the building, even to the minutest details, are worthy of, and deserve careful and more thorough consideration. Every one who has charge of a hospital for the insane will thank the author for the care he has taken to give such explicit directions in matters which, to an ordinary observer, would seem trivial and useless; but all such statements are in the interest of sound genuine economy (not that falsely so called), of ease of management, and of comfort and convenience to those who are to occupy the wards as long as the building stands.

"The difference in cost between a hospital that is well built and one that is badly constructed; between one that is complete in all its arrangements and one that is imperfect; between one liberally and one meanly managed, is really so small, that if the citizens of any State would make the simple calculation how much of this extra expense would fall upon each one of them, it can scarcely be credited that a single individual would anywhere be found willing to admit that he would not cheerfully bear his proportion of it, even if it had never occurred to him that at some period or other he might himself be compelled personally to test the character of the provision made by his State. Practically, the people on whom ultimately the cost of such institutions devolves, as far as I know, have never hesitated in contributing their share of what was necessary to effect the object thoroughly. They have only asked that what was done should be fully up to the knowledge of the times, and calculated to give the afflicted every possible benefit that could be derived from the expenditure, and that all waste and useless ornamentation should be avoided."

Particular attention is directed to the carefully written chapters on heating and ventilation, and to the maturely considered views therein expressed. To attempt to quote from them would require the transfer of whole chapters to these pages, and the subject, as therein treated, can only be properly understood and appreciated when read as an entirety and not in parts. It is astounding that men, calling themselves architects, should put aside the views expressed in this book, confirmed as they are by the experience and practical observation of gentlemen of character and standing in every section of the country, and substitute for them plans of their own, which have never been tested, and which depend for their success on details of arrangement and management difficult to maintain, and almost uniformly failures when practically tested.

The chapter on the cost of a hospital for the insane should be very carefully studied to correct some very erroneous notions which have been put forward by gentlemen whose lengthy dissertations are worth, in a practical point of view, less than the paper on which they are printed and the ink thus wasted.

What is really needed, as is fully shown in these chapters, is that a hospital should be economically built of the best material, put together in the most thorough and substantial manner, fireproof in all its arrangements, and so carefully apportioned as to give every required convenience, and the avoidance of the necessity of constant repair.

That such a hospital can be so built for a reasonable amount has been conclusively demonstrated, and the contrast between such an institution,

constructed with every appliance which the art and experience of the day have provided, and in a manner to stand any test to which it may be put, and a hospital built on the cheap plan, with the implied necessity of the expenditure, each year of its existence, in repair of the interest on the cost of construction, is such as to prove, beyond cavil, to any fair-minded man that there is, in reality and in truth, only one way in which a hospital for the insane should be planned and constructed.

In the second part of the volume, which treats of the organization and general arrangements of hospitals for the insane, so many subjects of interest are discussed that, in the space allotted, it is impossible to give any full discussion of them, or even make all the extracts which would indicate the author's views on those subjects. A few, therefore, can only be taken, for every one who has given any attention to the subject will coincide with these remarks:—

"Upon most of the prominent points connected with the subject there is believed to be nearly entire unanimity of sentiment among those who have charge of the hospitals for the insane in the United States; so that, in expressing my own opinions on many of them, I have little more to do than to record the convictions which have been forced upon a majority of those who have had opportunities of testing, practically, the actual requirements of this class of institutions."

"The trustees or managers will have the general supervision of the institution and of its affairs, and they should, at frequent stated intervals, either as a board, or by committees, make visits through every part of the hospital, and exercise so thorough an oversight of its expenditures and of its operations generally, as will tend to secure the confidence of the whole community, and especially of those whose friends are committed to its charge; and they should always give a genuine and liberal support to the chief executive officer, whose duties, at the best, are sufficiently irksome and laborious."

"The members of a board of trustees, performing their duties properly, are always able to exercise a most important influence on the prosperity of any institution, and on the welfare of its inmates; and they may also by injudicious measures, or a want of interest in its affairs, produce effects of an entirely different character. While giving the strictest attention to their own appropriate functions, they should most carefully refrain from any interference with what is delegated to others, and meddling with the direction of details for which others are responsible. Especially should they avoid any personal intercourse with subordinates, that might lead them to a course which would weaken the authority of the principal of the institution. It would, indeed, be a safe principle to adopt, that there should be no ties of a personal, pecuniary, or political character between a member of the board of trustees and those who are employed in any of the departments of an institution, which could at any time prevent an unbiased judgment in a case of difficulty. Under no circumstances should a trustee so far forget the proprieties of his station, as to resort to subordinates for information that should come from the superintendent, or to circulate unfavourable reports in regard to an institution, without having first informed this officer of their existence and tendency, and learning from him their truth or falsehood, as well as the reasons which may have induced acts which, although correct in themselves, might, without proper explanation, be readily so misunderstood as to do great injustice to innocent parties."

"It is scarcely necessary to say that it is quite inadmissible for trustees to have an interest, directly or indirectly, in any contract or in any purchase with which a hospital is concerned. Such a course may at least lead to suspicions, the existence of which, however groundless, is always to be deprecated, and may, under some circumstances, prevent a trustee from acting honourably and impartially."

The following extracts relative to the physician-in-chief are especially to be commended to the attention of all interested in the care of the insane

in these days when certain crotchety persons are endeavouring to introduce plans of management, which were tried, found disastrous, and abandoned years since.

"The physician-in-chief should be the superintendent and executive officer of the establishment. Besides being a well-educated physician, and of irreproachable moral character, he should possess the mental, physical, and social qualities to fit him for the post. He should serve during good behaviour, reside on the premises, and his compensation should be so liberal as to enable him to devote his whole time and energies to the welfare of the hospital. He should nominate to the Board suitable persons to act as assistant-physician, steward, and matron. He should have entire control of the medical, moral, and dietetic treatment of the patients, the unrestricted power of appointment and discharge of all persons engaged in their care, and should exercise a general supervision and direction of every department of the institution."

"It would seem to need but little argument to show that a hospital for the insane should have but one official head in reality as well as in name, to whom every one employed about it must be strictly subordinate. It would be just as reasonable to suppose that a proper discipline, or that good order would prevail in a ship with two or more captains, or in an army with two generals-in-chief, or in a college or a school with several principals, as to expect to find them in a hospital of the kind referred to, where two or more individuals are acting independently of all others, or in which there are certain officers over whom the physician-in-chief has no control. If such an arrangement ever worked well anywhere it must have been owing to some very rare or exceptional mental organization in those acting under it, and not because the principle is not so radically wrong. Every such trial—and there have been many within my own observation—so far as I know, has been a complete failure in the past, and in my opinion it will be so in the future.

"The very peculiar character of a majority of the patients received into such institutions, the numerous body of assistants required in their care, the large number of persons employed in the various departments, the necessity for active and unceasing vigilance, joined with gentleness and firmness in all intercourse with the mentally afflicted, and for prompt decisions in cases of difficulty, render it indispensable—if we wish the best results—that a large amount of authority should be vested in the chief officer."

"It must always be borne in mind that every department of a hospital for the insane, its farm and garden, its pleasure grounds, and its means of occupation and amusement no less than its varied internal arrangements, its furniture, its table service, and the preparation and serving of the food, the mode in which its domestic concerns are carried on, its heating and ventilation—everything connected with it indeed—are parts of one great whole, and in order to secure harmony, economy, and successful results, every one of them must be under the same general control. It is not to be supposed that the chief physician of the institution should personally superintend all or a majority of these matters, or fritter away his time in a constant attention to their details or even that he should be proficient in every one of them; but he should be expected to be so constituted mentally and physically, as to be able and willing to make himself familiar with all of them so far at least as to know when everything is in good order and when all services are properly performed. He should especially have that kind of tact and judgment which will enable him to fulfil efficiently one of the most important functions of his office, that of selecting individuals for every department, fully qualified to discharge their appropriate duties, and who will be held by him to a strict accountability for their proper performance.

"It is a great error to suppose that there is any detail about the management of a hospital for the insane, beneath the dignity or unworthy the attention of its chief medical officer. Everything that has any relation to the patients—and everything has some direct or indirect connection with them—may have an influence not readily appreciated by a careless observer, and to preserve unity of purpose, nothing should be arranged or changed without consultation with the head of the establishment."

"No one will deny that the arrangement recommended—which is the only one that can be relied on to work satisfactorily—places much power in the hands of the chief physician, but it must be remembered too that on him the responsibility also mainly rests. A man to whom this amount of control cannot be safely intrusted certainly is not the proper person to be placed at the head of an institution containing 250 insane patients. Dividing this power between two, three, or more would only tend to produce discord, destroy all proper discipline, and prevent prompt and wise action."

"The simple possession of adequate authority by the chief executive officer of such an institution often obviates the necessity of its being exercised. It may be unseen and unfelt, and yet a knowledge of its existence will alone often prevent wrangling and difficulties in the household, and secure regularity, good order, economy, and an efficient discipline about the whole establishment."

"The long-continued and uninterrupted performance of the duties of a hospital superintendent among his patients is a tax upon the mental energies and ultimately upon the physical powers of an individual not easily appreciated by those who have not had some experience of the kind, and one of the best modes of counteracting these effects is for that officer to devote a portion of his time to the supervision of out-door affairs. By this means without leaving home, he will not only have the invaluable advantage of active exercise in the open air, but also a form of occupation for the mind that will more effectually than any other divert it from the train of thought induced by a protracted visit through the wards. Change of occupation—both mental and physical—is the relaxation of a superintendent of a hospital for the insane, and is indispensable if he expects for any long period to preserve his health and usefulness. So many noble men in our own country have already broken down while engaged in the zealous performance of these duties, that hardly a better contribution could be made to the cause, or one that would more subserve the interests of the afflicted than that which would aid in preserving the mental and physical health of the right kind of hospital physicians, and in securing a proper supply of them."

One more extract must be given to indicate the views of the author on a question of great practical importance, the separation of the sexes.

"In every hospital the arrangements should be such that there will be little intercourse between male and female patients or the male and female attendants employed in their care. No particular disadvantage will result from their attending religious services or lectures in the same room, but on other occasions it will be best that they should be kept entirely separate. The advantages of frequent social parties, in which the two sexes meet on familiar terms, are very problematical, and balls for the males and females together, have in my experience appeared to be decidedly objectionable. Most of our hospitals receive patients from all classes of society, and where there is this indiscriminate mingling of both sexes and of persons in all stations in life, undesirable intimacies and acquaintances, in certain mental conditions, will often be formed, that may at least prove somewhat mortifying to a sensitive mind after a complete recovery. Patients, especially females, should always be protected from everything of this kind during their residence in a hospital. For these and other reasons, lectures, and entertainments of various descriptions in the lecture-room where there is no communication between the sexes, or parties for one sex alone, will be found much more desirable than the gatherings previously referred to. If all the patients in a hospital occupy about the same social position, the frequent meeting of the two sexes may be less objectionable, but even then I should not consider it very desirable.

"Where only one hospital is built in a State, it will, of course, be prepared, as shown in the plan, for patients of both sexes; and even where there are two hospitals, in entirely different sections of a State, it will still be best that both males and females should be accommodated in the same building, because the conveyance of patients from great distances to an institution involves much labour and expense, is often injurious to the sick, and is really in itself an evil of much magnitude which ought not to be unnecessarily increased; where a community,

however, is sufficiently populous to require two hospitals of the same general character in one vicinity, there can be little question but that many decided advantages and no disadvantages, will result from having one of the institutions appropriated to males, and the other to females exclusively.

"To those who realize properly the refining influence of female society, and the great importance of good nursing by women, during sickness, it may be said, that this separation of the sexes, so far as the insane are concerned, in no way interferes with the employment of women of high character and suitable age, education, and qualification, as nurses or companions in the wards appropriated to the men. This, indeed, has always been a part of the design of the writer in suggesting the plan under notice. It has, too, an especial advantage in enabling institutions to secure for the wards of the male departments the services of married men and women, having special qualifications, and who could not otherwise be thus employed. In many of these positions, these women, in addition to their social influence on the patients, would be valuable in securing the highest grade of ward housekeeping, although the author must frankly acknowledge, that in his experience the perfect cleanliness and excellent order of rooms, and the neatness and good taste shown in parlors, dining-rooms, and chambers, taken care of exclusively by men properly trained, cannot be surpassed. As a general rule, but not invariably, the females employed in the male wards should be the wives of men who hold positions of some kind in connection with the same portions of the hospital.

"It is scarcely necessary to say that the presence of male attendants is never to be permitted in the wards occupied by women, nor that of women—with the exceptions stated above—in the wards occupied by men, unless for special duties, by direction of the officers of the house.

"The Pennsylvania Hospital for the Insane at Philadelphia has now had an experience of twenty years with patients of both sexes in one building, and an equal period of experience with the sexes in separate structures. The results of the latter have been so clearly favourable there, manifesting only advantages, that I know of no official connected with the institution who would be disposed, under any circumstance, to abandon the system, or to return to one having the men and women in the same hospital. The plan has been adopted more or less completely in several other institutions in the United States, while it has received favourable consideration from prominent superintendents, who, owing to influences beyond their control, have been prevented from carrying out what they regard as a great advance in the management of the insane."

It would have given great pleasure to follow the author in what he says on the separation of the recent and chronic insane, always to be deprecated, on restraint and seclusion, on the question, "is there danger of the sane being admitted as insane?" on provision for insane criminals, on evening entertainments, and particularly to quote his charming chapter on a hospital day; but the assigned limits are already exceeded, and we must close, earnestly exhorting our readers to read the book for themselves, and be assured that they will find the most reasonable views, the most sensible recommendations, and the most practical suggestions in all matters pertaining to the care and treatment of the insane.

The publisher has done his part so well that the reader will not tire in looking over the clearly printed pages on such fine paper, and in carefully examining the admirable illustrations. J. C.

ART. XXIII.—*Transactions of State Medical Societies.*

1. *Transactions of the Medical Association of the State of Alabama. The Report of the State Board of Health. Annual Session. Montgomery, April* 12–15, 1881. 8vo. pp. 568. Montgomery, 1881.
2. *Transactions of the South Carolina Medical Association, Newberry, S. C., April,* 1881. 8vo. pp. 127. Charleston, 1881.

1. THE State Medical Association having been also constituted by the Legislature of Alabama the State Board of Health, the present volume of Transactions contains not only the ordinary annual proceedings, but also the report of the Committee of Public Health of the Board of Censors. The latter, a discursive report, discusses questions of quarantine, the collection of vital statistics, the care of the insane, and other sanitary questions, including, without explanation, a reprint of a lengthy paper by Dr. Geo. T. Angell, of Boston, upon the adulteration of food and drugs, which in itself occupies about thirty pages.

Nearly one-half of this volume is devoted to the minutes, special reports, and lists of officers and members. The actual papers and discussions occupy less than one-half, though some of the essays are of considerable length. The annual message of the President, Dr. Wm. H. Anderson, is a model address for the occasion, discussing especially the advantages of quarantine and the advancement of the standard of qualifications for the practice of medicine. In addition to the presidential address, there was an oration delivered by Dr. Milton C. Baldridge, whose appropriate theme was the Integrity of the Medical Profession. Among the prominent papers read before the session was one on the *Relation of Geological Formations and of Soil to Malarial Fevers, as Exemplified in Sumter County, Alabama*, by Dr. R. D. WEBB, ex-president of the Association, which is accompanied by two maps, geological and topographical. Sumter County is peculiar in its geological features. Being at the junction of the secondary and tertiary formations, crossed diagonally near its centre by the post-oak belt, overlaid in many places by the post-tertiary drift deposit of sand and clay, it presents a very great variety of soils, and gives opportunity for the study of their influence upon diseases in localities in juxtaposition. In regard to malarial disease with which this paper deals, the following observations are made:—

"Enlargements of the liver and spleen are rare in the lime sections, while they are very frequent, almost the rule, in the mixed post-oak and alluvial sections." Summing up, Dr. Webb concludes that "every part of the country is subject to malarial influences. The cretaceous lime or prairie parts less so at present than other sections, and much less so than formerly, owing, no doubt, to the exhaustion of the vegetable matter in the soils under the chemical influence of the lime, and to the improved character of the water. In those sections of the county where we have the mixed soils of the post-oak, lime and alluvial deposits, malarial diseases are more abundant and varied in type, and also in these sections the sequelæ, especially enlarged spleens and livers, are most common. This is not from the severity of the attacks (for here the fever is often in a masked form and generally apparently milder than in the cretaceous section), but from the peculiarity impressed upon the malarial poison by the character of the soil. The tertiary or sand-hill section, with its numerous alluvial bottoms, also suffers to a considerable extent, the type being midway between the open high grade fever of the lime section and of the lower grades of the mixed alluvial sections."

Dr. F. M. PETERSON contributes a monograph, *Notes on Diphtheria in Alabama.* The combined local and general treatment is advocated;

using as an application equal parts of tincture of the chloride of iron and glycerine twice daily, a gargle of chlorate of potassium and inhalations of steam; the general treatment, calomel, and camphorated Dover's powder, the dose of calomel in children being from one and three-quarters to two grains, given until the bowels are freely moved several times. When commenced early, this treatment is believed to be of the greatest importance, rendering the disease more mild and manageable. It is only to be given in the first stage of the disease, and never with a view to salivation. After the intestinal tube is cleaned out, the tincture of iron and glycerine mixture is given internally every two or three hours. For adults, the commencing dose is fifteen drops of iron and twenty of glycerine. The patient should be well nourished, but not stuffed with food; nor are stimulants considered necessary. Ventilation of the apartment and disinfection of all discharges and fomites are required. Strychnia by the mouth or hypodermically is recommended in paralysis. Tracheotomy is not considered of much value in laryngeal diphtheria, except to relieve impending suffocation.

A paper somewhat similar in scope on *Pneumonia as it Appears in Alabama* is furnished by Dr. JOHN ALBERT PRITCHETT, to which are appended tables from Mobile and Montgomery, showing the relations of deaths from acute pulmonary troubles and the meteorology of each month. The Topography and Climatology of Lee County, by D. W. Floyd, M.D., and the Diseases of Greene County, by Thomas W. Pierce, also furnish valuable information of the diseases of special localities; in both places typhoid and typho-malarial cases occupy considerable medical attention. An epidemic of Rötheln in Sumter County is described by Edward Henry Sholl, M.D., of Gainesville. An interesting paper by Jerome Cochran, M.D., entitled *Sketches of Yellow Fever on the Gulf of Florida*, contains the substance of two reports made to the National Board of Health, but not yet published by it from want of appropriation. The author is now collecting materials for a history of Yellow Fever upon the Gulf Coast, which, from the systematic methods of inquiry adopted, and his great experience, will form a valuable contribution to the vexed question at issue. In regard to quarantine, he reached the conclusion that "a single completely equipped quarantine station, with hospitals and warehouses and adequate apparatus for disinfection, supplemented by inspection stations at the several ports, was sufficient to meet the quarantine needs of our whole Gulf Coast." This station should be central, and "placed as near as possible to the mouth of the Mississippi."

Among the shorter papers, one on the Gouty Diathesis, by Nicholas Gilmore Thomas, is deserving of special mention on account of its able analysis of the pathology of this interesting condition, and the just appreciation of the principles of treatment.

One of the features of the meeting was the Omnibus Discussion, led by Dr. S. D. Seelye, of Montgomery, which was well received and admirably conducted. This is worthy of adoption by other societies, for such a series of topics, with such suggestive remarks as these, could scarcely fail of being successful in eliciting the experience of those in attendance and initiating a lively discussion.

2. Quite a number of interesting communications are found in the present volume of proceedings of the *South Carolina Medical Association*, most of which are brief practical notes or reports of cases from practice.

The President, Dr. B. W. TAYLOR, selected for the theme of his annual address *The Hygiene of Infancy*, and improved the opportunity of conveying very useful information with regard to the temperature, bath, feeding, and causes of mortality, impressing facts upon his hearers that can scarcely be too often repeated. For instance, among some useful suggestions upon the subject of artificial food, the following pregnant truth is enunciated:—

"In the administration of milk to children, it is always best to boil it; for, by so doing, we expel much gas whose oxygen tends to the formation of lactic acid, and we abstract a portion of its cream. Then again, should the milk contain vegetable germs or those of infectious diseases, this simple procedure would render it more safe and digestible."

Elsewhere he recommends the dilution of this cow's milk with a proper proportion of barley-water according to the age of the child, and a little white sugar; a very small amount of alkali or chloride of sodium, as recommended by Dr. Jacobi, is also approved. Many disorders of childhood might be prevented if the concluding words were generally heeded:

"It must be recollected that the child is to be fed on this diet until the sixth or eighth month, and then may be allowed one or two meals a day of beef-soup and bread or butter and hominy, or oat-meal and milk, and when older be permitted to suck raw beef and eat bread. This diet must be kept up until ten years of age, and every means taken to prevent nurses and others giving the child other food which either contains insufficient nourishment or will certainly tax the powers of digestion without in any way possessing more nutritious value than those recommended."

Dr. Taylor could not have selected a subject of more vital importance than this which he discussed, for it is unquestionably a fact that thousands of children are sacrificed annually from the want of proper knowledge of the principles of infant hygiene.

A report of the Executive Committee of the State Board of Health shows good work done, and more in contemplation. The general distribution of reports upon endemic and epidemic diseases, and upon vaccination, will doubtless do much to create a healthy tone in the minds of the public upon these important topics, in which the average legislator cannot be made to take too much interest, nor will he take any, as a rule, until compelled by enlightened public opinion. The report itself says:—

"Without the co-operation and assistance of the people, our work as sanitarians would soon have an untimely end. It is the part of the State and subboards to gain the confidence of the citizen in every way, and interest him in the work. . . . The field is so broad as to embrace within its bounds all men of education and culture."

Perhaps the Committee of the Pennsylvania State Medical Society, which has hitherto failed to secure the necessary legislation, may take a hint from this, and during the coming year, pay less attention to politicians, and more to the sovereign people. When the *vox populi* unmistakably declares in favour of a State Board of Health in this State, one may be established; we need scarcely hope for one before.

A remarkable case is reported by Dr. CORNELIUS KOLLOCK, under the title of *Polypus of the Cornea*. The growth had been once removed by excision, and had returned when first seen by Dr. Kollock. The tumour was about the size of an English pea, of a light gray or pink colour, with a delicate, but distinctly, marked pedicle, situated on the outer half of the right eye, about one line distant from the junction of the cornea with the

sclera. An examination with a glass showed that it was not of conjunctival origin. It was readily removed, its base being included in elliptical incisions. No microscopic examination was made. There appeared to have been a remote history of injury.

Dr. J. G. SEABROOK contributes an essay upon *Diphtheria*, in which he insists upon a recognition of its character as a general, and not a local disease, and points out its close affinities with scarlet fever, erysipelas, carbuncle, and malignant pustule. "The identity of membranous laryngitis or croup with diphtheria appears to be disproved by facts too evident to be disputed." In the treatment, chlorate of potash, in conjunction with the sulphate of quinine and Dover's powder, in very fractional doses, he uses with satisfaction. In the early stage, one or two applications of a strong solution of nitrate of silver (℈j–ij, to water and glycerine, each ℥ss), or in young infants hydrochloric acid and honey (equal parts) he uses with good results. The inhalation of an atmosphere, loaded with steam, and in older patients gargles of carbolized water (glycerite of carbolic acid ℥j–ij to water ℥x) three or four times daily are often serviceable. The atomizer is also used. Should there be embarrassed respiration, and apnœa from obstruction appear imminent, an emetic of ipecacuanha and sulphate of zinc or alum is recommended. Tracheotomy is not mentioned.

An essay on the *Sanitary Condition of a Ridge of Upper South Carolina, Oconee County*, is contributed by J. W. SPEARMAN, M.D.; it is the type of a paper that does not find its way into State medical societies' transactions as frequently as it should. Giving, as it does, valuable geographical, meteorological, and medical information with regard to a portion of the State, communicated by a resident observer, it will still be valuable for reference, when most of our ephemeral medical contributions will have lost their interest.

An account of a case of *Acute Chorea successfully treated with Veratrum Viride* is given by F. F. GARY, M.D. The patient, a student at college, had an attack of acute rheumatism, and during convalescence violent chorea appeared. Ordinary treatment seemed only to aggravate the symptoms, until he was given large doses of veratrum viride. It is not stated what preparation was used. A cure resulted in two months.

Dr. JAS. MCINTOSH reports that for the last three years he has been using *Cinchonia* as a substitute for, and in preference to, quiniæ sulphas, and urges a more general use of this remedy, which he considers equally effective in malarial troubles. Children readily take it (cinchonia, twelve parts; sugar of milk, sixty parts; bicarb. soda, one part) dissolved in milk and water. Its cheapness is certainly a strong argument in favour of its employment.

Dr. C. R. Taber reports a number of cases showing, apparently, a direct relationship between uterine disease and attacks of hæmoptysis.

A curious case of Recto-Vesical Fistula in the female is communicated by Dr. J. R. Bratton, in which the uterus was retroflexed and retroverted, and a channel had formed above the uterus between the bladder and bowel. No operation was recommended.

Some peculiarities of *disease*, as it appears *in the negro* race, more particularly in the neighbourhood of Woodlawn, S. C., are considered in a paper presented by Dr. MCKIE, of Edgefield County. The tendency of malarial affections to appear in a modified form in the African race is noted. Pulmonary diseases, especially following measles, are prevalent and fatal; depletion is not well borne. Phthisis has become more com-

mon since the war, possibly owing to some changes in the habits, food, and mode of life. Abdominal diseases are not prominent; but nervous disorders, especially tetanus, are not uncommon. Recently malarial fever has assumed a typhoid character (typho-malarial?), and the treatment required is that of a low, continued fever.

Dr. Jas. Evans reports a case in which a dysmenorrhœal membrane, with openings corresponding with the os internum and Fallopian tubes (!), was discharged during gestation with a moderate amount of hemorrhage. "The novel feature in this case is the exfoliation of the membrane after pregnancy had advanced two months."

Dr. THOMAS L. PARKER reports several interesting *surgical cases*. A paralysis of the extensor muscles of the hand and forearm, from accidental division of posterior interosseous nerve by a pruning-knife, was completely cured by a suturing of the ends of the divided nerve, three months after the original injury. An instance is recorded of an abscess of the mastoid process connecting with a post-pharyngeal abscess. A very unusual case of chronic ozæna, of sixteen years' standing, in which a quartz pebble was found to be impacted in the inferior turbinated bone, resulted in necrosis of this bone, which was removed. A flea on the tympanum led in another patient to otalgia, hemicrania, and orbital neuralgia with ear-cough; its removal, after six months, was followed by relief of all the symptoms. A case of dysphagia from paralysis of the superior laryngeal nerve in a man of sixty years was followed by recovery after prolonged treatment. In a case of congenital dislocation of capsule and lens, with resulting excessive hypermetropia, "Convex $2\frac{1}{2}$ increased vision for reading from one inch to two inches in both eyes, and enabled the patient to pursue her studies at school very comfortably." Finally, in another eye-case, "a piece of iron, half an inch long by one-fifth of an inch wide, imbedded in the vitreous chamber for seven years," was extracted (the patient refused to permit enucleation) through a scleral incision with immediate relief of urgent symptoms, and the integrity of globe eventually preserved. He could see light and count fingers obliquely from the nasal side. Three years after the operation, he had not had any further trouble; "the injured eye is as natural as the other, except the contracted pupil and the restricted vision." This concludes a remarkable series of cases, and a very interesting and highly creditable volume of transactions. The South Carolina Medical Association is apparently prosperous, and eminently deserves to be so, judging from the character of its proceedings. F. W.

ART. XXIV.—*The Practice of Medicine and Surgery applied to the Diseases and Accidents incident to Women.* By W. H. BYFORD, A.M., M.D., Prof. of Gynæcology in Rush Medical College, Chicago, etc. Third edition, thoroughly revised and rewritten. 8vo. pp. 682. Philadelphia: Lindsay and Blakiston, 1881.

A COMPARISON of the latest with the previous edition of Dr. Byford's book gives the reader a startling idea of the progress of gynæcology. In the period covered by these two editions from 1867 to 1881, not only has it continued to occupy its old field, but has reached out in various directions, and appropriated to itself various operations once belonging to the

domain of general surgery. In fact, it has been the aggressive branch of medical science, claiming its own wherever found, discovering new conditions, inventing new operations, and in truth, thinking for a moment of the view held by some, of the cause of cervical laceration, one might almost say that, allied with obstetrics, it had created the diseased condition for the cure of which, by a still more daring flight of genius, it has discovered the successful operative relief.

Dr. Byford calls the present edition "almost a new book," not only with an apparent increase in the number of pages, but by the removal of many subjects altogether, great space has been gained for the consideration of new topics, whose names even the index of his earlier editions omitted to mention. While the book retains its general characteristics of manner and method it will be found more ample, more polished, and a complete working book for the student of gynæcology.

The principal additions are in the chapters on laceration of the cervix uteri, perimetritis, cancer, fibroid tumours, ovarian tumours, and ovariotomy. In regard to lacerations of the cervix, the author explains the remarkable circumstance that the baleful effects of laceration remained so long undiscovered, by the fact that the symptoms accompanying the condition were so readily relieved, if only temporarily, by ordinary treatment, and we notice this as unconscious testimony to the fact, now almost forgotten in the glamour of operation, that it is by no means every lacerated cervix that requires surgical aid. Women are still recovering by local and general treatment from the ills that flow from this cause, are enjoying comfortable lives, and bearing children successfully, as they did before Dr. Emmet's researches in this direction. It is only where other means have failed, only where the discomforts really exist, that the operative procedure is demanded.

Dr. Byford does not take the absolute ground that lacerations of the cervix, any more than lacerations of the perineum, are always caused by the use of the forceps, simply saying, "the time has not yet come when the facts are at hand to justify such criticism," a criticism which threatens to create a sentiment adverse to instrumental delivery, such as existed after the first general introduction and frequent use of these valuable aids, and which the profession has only overcome during the last fifteen years. Statistics on this point, after all, only prove that the lacerations occurred with, not by, the forceps. In regard to their prevention the author leaves it vaguely to the skill of the obstetrician of the future, saying: "The probability is that it cannot be prevented in most instances in which it occurs."

In his method of operating the author differs but little from others, passing his wires by means of threads, a method now abandoned by many as tedious and unnecessary; he secures his sutures by twisting, and he insists, as an important condition for successful union, on a thorough cleansing of the opposing surfaces as each stitch is secured.

The chapter in the second edition on "Nitrate of silver and its substitutes" is appropriately replaced in the present by one upon "Occasional untoward effects of uterine manipulations and operations," a summary of Dr. Englemann's paper on the subject. The author's chapters on perimetritis and displacements are clear, full, and abounding in his own personal experience. Of cancer of the cervix he says, after reviewing the various measures advocated, that the removal of all the diseased tissues in reach with the curette and the use of the thermo-cautery "will promote the comfort of the patient more than any other measure."

Of fibroid tumours and their treatment by ergot he writes *con amore*, and it forms the most original part of the book, while in the second edition the whole subject is dismissed briefly under the head of "Tumours of the Uterus." The question of oöphorectomy for the arrest of growth of fibroids is discussed in Chapter XXXV. The key-note of the author's view is that the operation "leaves a large highly organized organ without its regulating apparatus, the subject of any morbific causes." The subject of ovarian tumours and ovariotomy occupies the concluding portion of the work.

In short, the book is brought up to the standard of to-day, and in most respects may be considered a reliable practical text-book, written by an earnest worker and a practical man. E. W. W.

ART. XXV.—*Transactions of the American Otological Society, 14th Annual Meeting.* Vol. II., Part 5, 8vo., pp. 511. Boston, 1881.

UNDER the head of *Suggestions Regarding the Treatment of Suppurative Otitis*, Dr. Theobald, of Baltimore, recommends the insufflation of a powder, composed of equal parts of finely powdered boracic acid, and oxide of zinc, and reports a number of cases illustrating this treatment. In some cases alum was substituted for oxide of zinc. Other members of the society have used the boracic acid powder extensively, and with good results, either alone or combined with other powders—as alum, tannin, oxide of zinc, or calendula.

Dr. D. B. St. John Roosa contributes a paper *On the Value of Operations in which the Membrana Tympani is Incised.* His estimate of their value may be best given in his own words:—

"As for myself, I will say that I have given up all operations in cases of chronic proliferous inflammations, or, if you prefer the term, in chronic non-suppurative cases where there are, perhaps, adhesions between the ossicles, or between an ossicle and the promontory, and where there is no suspicion of retained mucus in the tympanic cavity.

"I have finally rejected operations in these cases, because some experience of my own, in the way of division of the tensor tympani, insertion of an eyelet, attempts at maintenance of a permanent opening by means of incisions, and frequent paracenteses, have convinced me that these operations are inadequate to relieve tinnitis aurium, improve the hearing, or retard the advance of a disease which, as yet, must be pronounced as hopelessly incurable as chronic non-inflammatory glaucoma or atrophy of the optic nerves."

This honest confession of a most unpleasant clinical truth, coming from an acknowledged authority, and receiving, as it did, the unanimous approval of the society, is worthy of note. The question has been squarely met, and, as far at least as this country is concerned, these useless operations may be considered as having passed into history.

The puncture of the membrane to give exit to accumulations of fluid in the tympanum is, of course, another matter, and, in properly selected cases, is approved of by the author, though he does not consider it necessary to "incise every bulging drum head," and regards "paracentesis of the membrana tympani as an operation not to be lightly undertaken."

Dr. J. Orne Green, of Boston, treats of the *Removal of Foreign Bodies by Displacement forwards of the Auricle and Cartilaginous Meatus*, and

reports a case in which the operation was performed. The patient fired two shots into his auditory meatus from a small pistol held close to the ear. Six days afterwards, "a semicircular incision was made above and behind the auricle, through the periosteum, and the periosteum with the auricle and cartilaginous meatus carried forward till the edge of the osseous meatus was reached; the insertion of the cartilaginous to the osseous passage was then cut through in its upper and posterior part, and three masses of lead were removed with forceps. The patient did well at first, but died in five or six days, and an autopsy showed that a small piece of bullet had penetrated the roof of the tympanum and entered the brain. Only one of the pieces of lead removed could possibly have been extracted through the external orifice of the meatus.

This operation was first suggested by Paulus Ægineta in 660, and has recently been recommended by Hyrtl, is approved by Von Troeltsch, and has been successfully performed once by Langenbeck, and three times by Schwartz. Dr. Roosa stated that he had successfully removed a bullet by this operation.

Dr. Charles H. Burnett, of Philadelphia, reports a case of *Malignant Growth in the Naso-pharynx with Early Aural Symptoms.* The patient, a physician forty-five years of age, applied to Dr. B. for relief from deafness. There were also some nasal catarrh and a sensation of moving fluids in his tympanum when he blew his nose. Bubbles were seen behind the membranes, and both membranes were punctured, with great relief to the hearing. The deafness, however, returned, the nares became more and more obstructed, and taste and smell failed. The nature of the disease soon became evident, and the patient died in four or five months. The microscope showed the growth to be a round-celled sarcoma.

A Case of Epithelioma of the Middle Ear, reported by Dr. Charles J. Kipp, of Newark, N. J., is interesting on account of its rarity. The patient, who was 50 years of age, had had an offensive otorrhœa since childhood, and the author suggests the possibility of a connection between the long continued inflammation and the development of the malignant disease.

Dr. Albert H. Buck, of New York, reports two cases of *Sudden Loss of Hearing in one Ear during an Attack of Mumps.* The first patient was a delicate girl, sixteen years of age. On the third day there was acute pain in the right ear, accompanied with a singing noise, and the following day, it was discovered that hearing was entirely gone in that ear. In the absence of any evidence of disease in the middle ear, the lesion, probably extravasation of blood, was referred to the labyrinth, and as there were no symptoms of auditory vertigo, the author concludes that it was confined to the cochleal portion. Reference is made to the suggestion of Vogel that the facial nerve seems especially adapted to convey the inflammation from the parotid gland to the internal ear. There was, however, no facial paralysis in this case.

The second patient was a man forty-five years of age. In this case also the aural symptoms appeared on the third or fourth day of the attack. There was complete deafness with a loud roaring sound, but no pain. On the fifteenth day, there were nausea and dizziness, and loss of equilibrium. No indication of disease of the tympanum. As to the seat of the lesion in this case, the author concludes that a second effusion of blood or inflammatory exudation took place in the labyrinth about fifteen days after the first attack, and that "while in the first attack it is fair to assume that

the cochlea alone was involved, in the second, it may, with equal propriety, be taken for granted that an escape of blood or plastic exudation took place in the vestibule or in the ampullæ of the semicircular canals."

In the discussion as to the obscurity in regard to the path followed by the disease from the parotid to the labyrinth, Dr. John Green suggested that it was not necessary to assume direct connection from the facial region to the ear, and that the disease of the labyrinth might be a remote complication of mumps similar to orchitis.

Dr. Albert W. Buck, of New York, describes a case of *Vascular Tumour of the Membrana Tympani*. There was a vascular growth on each membrane, shaped like a mole or teat, and about a millimetre in diameter. The author considers such tumours in otherwise healthy membranes very rare.

Dr. Clarence J. Blake, of Boston, made a verbal communication suggesting a *selection of test words according to their logographic value.*

"The comparative value of the consonant sounds one to another bear a fairly, but by no means absolutely, definite ratio. If, therefore, we take the consonant sound which requires the greatest force in production, which has, in other words, the greatest logographic value, and which would be most readily heard, and express its value as 100, and that of the other consonants accordingly, we have a table from which we may select the materials for a list of test words based upon the intensity rather than upon the pitch of the voice-force produced and serving, as in cases of chronic middle ear disease, for instance, as a measure of the obstruction presented to the passage of sound."

Dr. Samuel Sexton, of New York, exhibited a *flexible Eustachian catheter* made of soft rubber. The catheter is somewhat larger than those ordinarily in use, and is firm enough to be used without a stilette, and its introduction is less painful to the patient.

G. C. H.

ART. XXVI.—*Reseña del primer ejercicio del Instituto de Terapêutica Operatoria del Hospital de la Princessa*, por el Dr. FEDERICO RUBIO Y GALI.

Report of the First Proceedings of the Institute of Operative Therapeutics of the Princess Hospital. By Dr. FEDERICO RUBIO Y GALI. 8vo. pp. 220. Madrid, 1881.

THIS paper-bound volume is the report of a year's work done by an association which differs from any organization in this country with which the reviewer is acquainted. The Institute of Operative Therapeutics is connected with the Princess Hospital, and is organized for mutual instruction, which is obtained by studying the cases in the wards, dispensary, and operating rooms under the control of the Institute. No more than twenty-five subscribers are admitted in one year, each of whom pays a fee of about fifty dollars (250 pesetas). This however creates him a perpetual member, who is not required to subscribe for the further courses. No one is eligible unless he has the degree of Licentiate or Doctor in medicine and surgery. During the course of 1880–1881 there were twenty-three subscribers. The operative and administrative duties seem to have been given to those specially fitted by training or connection with the hospital to perform them. The arrangement of wards,

beds, furniture, nursing, and diet, and the disposition of the specialties, such as orthopædics, laryngology, otology, and pathology, are related by the author, who states that laboratory work thus far has not been provided for, because of the impossibility of getting an apartment. Pathological and histological anatomy, however, have been awarded a certain amount of attention by arrangement with private individuals. The instruction is obtained by what is called "the familiar and mutual method" (p. 10); and by conferences at which various gentlemen examine the patients and give their views. Independent research and observation is of course encouraged. The titles of some of the conferences show that abstruse subjects are at times studied in this way by the institute. Among others the author mentions the following: The morbid responsibility of the tissues: Ruptures of the common vertebral ligaments: and Lateral and angular spinal curvatures.

In operative surgery the use of chloroform was general, and this agent was deemed as safe as other anæsthetics, if properly handled (p. 100). A special administrator of anæsthetics was designated for this surgical service. Antiseptic dressings were largely employed, and are favourably considered after a somewhat extended use.

Quite elaborate statistics of the patients treated and of the results are given; and as the operations include amputations, resections, tracheotomy, extirpation of larynx, laparotomy and excision of uterus, ligations, and nephrotomy, it is seen that capital surgery is well represented.

Some of the observations made have been already printed, it is stated, in *El Siglo Médico;* others are included in the volume before us.

Many of the cases are of an instructive nature and present important surgical points. One case of gastric fistula situated below the cartilages of the left ribs allowed observations on the process of digestion. In a case of nephrotomy, done after exploratory acupuncture and rectal exploration, hemorrhage from the supra-renal vein occurred, which was, however, controlled. No calculus was found in the kidney, but evidences of perinephritic inflammation and of renal disorganization were present. Nearly two weeks later death occurred. Many other cases are detailed. The volume concludes with three lengthy papers on laryngeal phthisis, tubercle and its curability, and etiology and treatment of laryngeal phthisis, presented at the conferences mentioned, by Doctor Ariza; and one on the art of amputating, apparently by the author of the volume. J. B. R.

ART. XXVII.—*Observations on Fatty Heart; Comprising Remarks on the Morbid Anatomy, Symptoms and Diagnosis, Prognosis, Etiology, and Treatment.* An Essay. By HENRY KENNEDY, A.B., M.B., University of Dublin, etc. etc. 12mo. pp. 171. Dublin: Fannin & Co., 1880.

THE title of this little volume by no means indicates the comprehensiveness and complexity of the subject selected by the author for his essay. It is, in fact, difficult for the reviewer to state concisely the general scope of the work, unless it be a confessedly incomplete account of the author's views upon what he terms the "fatty disease," a morbid condition of which "the two great divisions are known as fatty growth and fatty degen-

eration," and of which the further divisions, doubtless arranged for the sake of clearness of description, are laid down as follows:—

"The first of these must again be divided into the general state, affecting more or less the entire frame, and which is known as obesity, and the second as the same condition, confined to the heart alone."

Resorting to an unusual, but by no means original arrangement of the topics, the author treats of these two subdivisions of his subject, namely the "general state affecting more or less the entire frame" and "the same condition, confined to the heart alone," in a sort of interwoven manner, carrying them through the various headings of morbid anatomy, symptoms, diagnosis, prognosis, etiology, and treatment, now side by side, now round and round each other, now broadside on, and at all times in inextricable confusion, but never with the slightest semblance of orderly arrangement and progression. It is to this unfortunate disorder of arrangement in part, and in part, doubtless, to a still more inexact and inconsequential style, and most probably to other causes also, that is due the author's confession (p. 168) that he has "written more of what might be called *disjecta membra* than an essay," an opinion in which every reader who attempts the perusal of his book will heartily concur, at the same time thinking of the extreme "disjection" of the members caused by a sausage machine or the explosion of a naval torpedo.

All this is the more to be regretted, for the reason that the book contains much that, if read aright, is very valuable and suggestive; while many of the facts are the result of close observation and careful study by the now fading light of a long experience. It is to be regretted that the matter did not take the form of a book at an earlier date. In its present form it will escape the notice accorded to more methodical and concise monographs, either upon obesity or upon the diseases of the degenerative periods of life, including fatty degeneration of the heart from local or general causes. J. C. W.

ART. XXVIII.—*Health Reports.*

1. *Eighth Annual Report of the Secretary of the State Board of Health of the State of Michigan, for the fiscal year ending September* 30, 1880. 8vo. pp. 508. Lansing, 1881.
2. *Second Annual Report of the State Board of Health, Lunacy, and Charity of Massachusetts*, 1880. *Supplement containing the Report and Papers on Public Health.* 8vo. pp. 197. Boston, 1881.

1. THE handsome volume from the *Michigan* Health Board, is unusually rich in interesting material, even for the valuable series to which it belongs. It comprises in addition to the customary suggestive Report of the able Secretary, Dr. Henry B. Baker, of Lansing, the proceedings and addresses of the Sanitary Convention at Detroit, and the transactions of the Sanitary Convention at Grand Rapids, both of which highly successful gatherings of Sanitarians were held during the early part of the year 1880. Much useful information upon a great variety of hygienic subjects is afforded in the well-written papers of these two meetings.

Among the special reports to the Board itself, perhaps the most important are those in regard to Diphtheria, Scarlet fever, and Smallpox; in

which an earnest effort appears to have been made, by combining the investigations of numerous independent observers, to discover the best methods of preventing the development and spread of these terrible maladies. With such an abundance of material as the soil of Michigan seems to produce, and such enthusiasm as her physicians manifest, we may hope for some strikingly valuable results, as these observations are prosecuted in the light furnished by Pasteur's recent wonderful researches concerning the "Germ Theory of Disease," and H. C. Wood's, in regard to the essential role of Bacteria in the production of Diphtheria.

At the Detroit Convention, instructive essays were offered on the *Contamination of Drinking Water by Filtration of Organic Matter through the Soil*, by Prof. V. C. VAUGHN, of Ann Arbor; on the *Prevention of Pulmonary Consumption*, by Prof. H. F. LYSTER, of Detroit; on *Sanitary Rewards and Punishment*, by Hon. H. W. LORD, of Detroit; on the *Use of Household Filters for Potable Waters*, by Dr. Albert H. Prescott, of Ann Arbor; on the *City of Destruction* (meaning Memphis, Tennessee), by Professor R. C. KEDZIE, M. D., President of the State Board of Health, and on *Adulteration of Food*, by Professor CARL JUNGK, of Detroit. The paper by Prof. C. J. LUNDY, of Detroit, on *Imperfect Vision Caused by Imperfect Schools*, ably urges the correct principles which should guide educators in this important matter, as briefly set forth in a review of Cohn and other authorities on school hygiene in our columns a few years since. Dr. J. S. Billings, whose immense experience so amply qualifies him to act as the fly-wheel for the hygienic machinery of America, moderating the excessive activity of youthful enthusiasts, made some amusing and pertinent remarks about the needless dread of carbonic acid, apropos of the subject of ventilation.

At the Grand Rapids Convention, after an interesting address by the Right Rev. G. D. Gillespie, President, Dr. H. B. BAKER read an excellent essay on the *Importance of General Sanitation to the Public Welfare and a Plea for Better Methods*, the whole of which is well worthy of careful study by every one interested in the care of the health. His paper was followed by one from the Rev. J. MORGAN SMITH, of Grand Rapids, on the *Duty of the Christian in Respect to the Laws of Health*, in which he takes the unassailable ground that "established sanitary knowledge involves a general Christian duty, under the command of Christian justice—to do by others as we would they should do by us; and the spirit of Christian love which worketh no ill to its neighbors." Several articles on sewerage, on school hygiene, etc., compose the rest of the report of this Convention.

The latter half of the volume is largely made up of Secretary Dr. H. B. Baker's compilations of the reports from all parts of the State, in regard to the diseases, meteorology, etc., during the year 1880. These deductions are admirably illustrated by improved charts, designed by Dr. Baker, and constructed on the plan which he has laboured so much and so worthily to popularize. There are also appended an elaborate series of observations on the *Causation of Intermittent Fever*, comprising an investigation into the meteorological and other conditions governing its production, by A. W. NICHOLSON, M.D., of Otisville, Michigan; an essay by J. H. KELLOG, M.D., of Battle Creek, on *Emanations from Decaying Wood as a Cause of Disease*, in which the author contends that wood, and especially large masses of sawdust undergoing decay, taint the atmosphere and give rise to zymotic diseases, particularly those of a malarial character; and two papers on the important, though but little

understood, subject of ozone in the atmosphere. The first of these latter articles, contributed by Dr. J. Mulvany, of the English Royal Navy, comprises the results of observations made under most of the varied conditions of climate, met with between the Doggerbank on the North, and the Falkland Islands on the South. Respecting the connection between the amount of atmospheric ozone and disease, Dr. M. remarks that during the cholera epidemic of 1871 in the East, the ozonic condition presented no peculiarity either in paucity or abundance; also that he has seen consumption rare both in countries where ozone is usually abundant, and where it is commonly deficient, so that he does not believe that ozone tends either by excess or deficiency to promote this disease. The only influence which in Dr. M.'s opinion ozone has upon the human system, is that which it appears to exercise upon the procreative functions, its excess seeming to increase the chances of fecundation, in one of the instances noted in the proportion of 100 to 57, in a village of Ceylon. Dr. A. W. Nicholson, in the second of these interesting essays upon ozone, records a multitude of observations with Schonbein's test-papers, which seem to show in a general way that the air of a pine forest, contained less ozone in winter and more in summer than the open country air; that the air over charcoal pits contained decidedly less ozone than that of the open country, both by night and by day; that the impure air near decomposing animal excreta had its amount of ozone materially diminished, etc. etc. Dr. N. finally concludes that many of the results of ozonometric observations are clouded with error, and that much study is yet necessary, before the best methods for accurately estimating the quantity of ozone present at any time in the atmosphere will be determined. Dr. Nicholson disputes the opinion of Prof. Von Pettenkofer that because ozone can never (he says) be detected in our dwellings, its hygienic value does not seem to be very great; asserting that he has several times discovered ozone in houses where ventilation was prevented, and suggesting that the volume of smoke which usually, though imperceptibly, escapes from the stove or heater, contains some material, perhaps sulphurous acid, that causes a change in the iodine as rapidly as it is liberated, resulting in the formation of a colourless iodate on the test-papers, which of course renders utterly fallacious the conclusions from Schonbein's test.

The first article in the *Massachusetts* Health Report, is one on *The Pollution of Streams*, by W. E. HOYT, C. E., which consists of the results of a careful and minute examination of the condition and chief sources of danger, from a sanitary point of view, of the Deerfield and Miller rivers, in the west-central part of the State. Such investigations have of course chiefly a local importance, although their usefulness and indeed their vital necessity is so great, that the excellent example here set should be followed in every town, village, and rural district throughout the land.

A thoughtful paper on *The Separate System of Sewerage*, by Mr. E. C. CLARKE, considers the highly-praised method recently put in operation in Memphis, Tennessee. The conclusions arrived at are, that where cellars are so low that they must be drained by pumping, this system of conveying away the surface and roof water, separately from the sewage, is necessary, but that in other cases its only merit is its cheapness, and even where this is important, the separate system would only be advisable where a good fall (one in the hundred) could be obtained. When storm water flows off by surface drainage, the first cost of sewers for sewage only is about sixty per cent. of the ordinary method, but the final economy will depend on

circumstances. In places where on account of the inconvenience and damage from surface drainage of rain, which increases with the growth of a town, it becomes necessary to carry off storm water underground, from closely built up and densely populated districts, and where new sewers must be constructed for the purpose, the combined system is evidently the cheapest.

Dr. J. F. A. ADAMS, of Pittsfield, Massachusetts, contributes an able essay on *Intermittent Fever in Massachusetts*. It is a curious and interesting fact that at the first settlement of the State, people built their houses on the hill tops to avoid the malaria of the valleys, but with the clearing and cultivation of the country this disease poison seemed to wholly disappear. From 1800 to 1850, ague was almost unknown, as an indigenous malady, in New England, but in the latter year it gained a foothold in Connecticut, on the shore of Long Island Sound, and about 1864 began a northward march across the western half of Connecticut and has steadily pushed forward, until in 1875 it reached the northern boundary line and stepped over into Massachusetts in 1877. In the three following years it made a further rapid advance, invading a considerable number of towns in the latter State. This paper is illustrated with maps and plans, and exhibits the results of a large amount of industrious and painstaking effort, to collect accurate information respecting the progress, apparent causes, and coincident events of the disease, so that it forms a useful contribution to the literature of malarial affections.

School-House Sanitation is the subject of a long paper by ERNEST W. BOWDITCH, C. E., of Boston, in which are reported the results of a very extended examination of school-houses in various parts of the State. Among the author's conclusions which we notice with approval are, that in school architecture it should be carefully provided for, that girls between the ages of thirteen and twenty ought not to go up and down stairs more than is absolutely necessary; that urinals create most of the smell usually attributed to water-closets, and in almost every case a smell is due largely to lack of janitor's work, so that it is a popular fallacy that such places cannot be kept clean and free from odour; that whilst light is better supplied from the sides of a school-room, the question of ventilation by the aid of the windows complicates the problem, so that it is not yet fully settled; and that where there is a public water supply, of recognized purity, it is better to depend on it, than on well-water, though if well-water is resorted to at all, the well should be kept in constant use. The method of warming school-houses, says Mr. Bowditch, through indirect steam heat, that is, where the radiators are all boxed up at or near the ceiling of the basement, and currents of outside air are passed through them, and then up into the rooms and hallways, is thought to be the best devised. Too often, however, in cold weather "cellar-air" is used, and the method then becomes highly objectionable. Next to well managed indirect steam, in point of efficiency, is furnace heat, then follows direct steam heat, and lastly heating by stoves. Open fires (of course the best of all) are unfortunately excluded on account of cost.

The volume concludes with some interesting papers on *The Health of Towns*, comprising the account of an *Epidemic in Adams*, by J. F. A. ADAMS, of Pittsfield; an article on the *Sanitary Condition of Holyoke*, by E. W. BOWDITCH, C. E.; and one on *Neglect of Vaccination*, by Z. B. ADAMS, of Framingham. J. G. R.

ART. XXIX.—*Lectures on the Surgical Disorders of the Urinary Organs.* Delivered at the Liverpool Royal Infirmary, by REGINALD HARRISON, F.R.C.S, etc. Second edition, considerably enlarged. 8vo. pp. 399, with plates. New York: William Wood & Co., 1881.

THREE years ago the author of this volume issued one of modest pretensions, but of considerable merit, which was noticed in these pages, and of which this is the successor. The title-page has been changed to correspond with the wider range of subjects now treated of, and this "second edition" is, in many regards, to be looked upon as a new book. In it the author considers the nature, causes, and treatment of stricture of the urethra, suppression and retention of urine, the operations for urinary abscesses, and fistulæ, the management of foreign bodies in the bladder or urethra, irritability of the bladder, inflammation, disease of the prostate gland, urinary concretions, and the means of removing them, with injuries of the bladder, ureters, and kidneys, deformities of the penis, and finally, varicocele.

The easy colloquial style of clinical lectures is favourable to the presentation of matters related to, if not directly in the line of the subject under consideration. This is happily exemplified in the book before us, where some very interesting and valuable suggestions come in by the way, as it were.

The author has adopted Dittel's classification of strictures according to the seat of the obstructing body, viz.: 1, within the lumen of the urethra; 2, in its wall; 3, outside of its wall. He calls attention to the extremely important fact that strictures are not always concentric: that is, the passage is sometimes to one side of the real axis of the urethra. Again he dwells upon the influence exerted by the "temper" of a stricture: an element which sometimes plays such a trick as to permit a tyro to pass an instrument easily into a bladder after a practised operator has attempted it quite in vain.

Apropos of what is sometimes called nervous, or spasmodic stricture, we find allusion to Sir James Paget's capital expression of "stammering with the urinary organs"—and excellent advice as to the principles which should govern the moral or mental treatment of such cases. Curious methods, adopted by patients to start their water, are given, and stress laid upon the necessity of suppressing the contemptuous mental attitude which some of these would be apt to excite.

"You will not cure your patients," says the author, "by asserting your belief in the non-reality of their ailments, but having carefully established the absence of any organic disease, you may, by your counsel and advice, as well as by your medicine, often do much in restoring the nerve tone which is deficient, and so prevent the patient drifting into a hopelessly depressed mental condition." And again, what is equally important, "In arriving at the conclusion that a case of impeded or hesitating micturition is functional and independent of structural alteration, you must remove all source of error by a careful physical examination of the urethra. If you learn to acquire delicacy and tact in the use of urethral instruments necessary for the purpose, you will never give your patient cause to regret that he has submitted to such an exploration; on the contrary, in the absence of true stricture, he will be comforted by the assurance that he can be completely and permanently relieved."

Eighteen pages are given to considering the examination of the urine. This chapter appears to us,—notwithstanding the author's explanation

that it is not meant to be full—to be too unsystematic. It would do well enough for an informal talk with another medical man, and few but would be the wiser for listening to it; but for a chapter of a book, and even for a clinical lecture, it is susceptible of considerable improvement. For example, a method of testing for albumen might be set down, and the remarks on blood in the urine enlarged so as to distinguish better between its various sources. One sentence in this chapter, however, might be taken to atone for more omissions that occur. This is the following: "The detection of albumen, under these circumstances must be followed up by a careful microscopical examination of the urine, in search of casts or other direct evidence of renal mischief." The word "must" is exactly the right one, and the clause "under these circumstances" should have been left out, and the exhortation should apply to every case where albumen is discovered in the urine.

Speaking of gradual dilatation of strictures, the good maxim, "Festina lente" is wisely quoted, and emphasized with the statement, "I do not know anything which interferes more with the treatment of urethral affections than the apprehension, on a patient's part, of undergoing a repetition of catheterism where bleeding and pain were the chief features of the preceding one."

For exploring the urethra, the author prefers a plain bougie, and does not believe in the olive pointed ones.

When he leaves an instrument in the urethra to effect dilatation, he always watches the patient's temperature, and if a rapid rise occurs, withdraws the instrument at once. He believes that the use of anæsthetics goes far to prevent urethral fever, and that aconite is "almost a certain prophylactic when administered in two minim doses of Fleming's tincture immediately after catheterism." He says that if, before thrusting in an aspirating needle to empty the bladder of retained urine, the finger be pressed firmly down about the pubes, till a pit is formed, the passage of the needle is absolutely painless.

When speaking of internal urethrotomy, the author alludes to the standard of calibre, for the urethra, set up by Otis, and the practice of dividing the tissues when this seems to be ever so little encroached upon. This practice Dr. Harrison deprecates and arrays himself with those more conservative men who have not been carried away by the fascination and ingeniousness of Otis's views.

The ninth lecture contains the discussion of external urethrotomy and a full description of the operation and instruments devised by Mr. Wheelhouse, of Leeds. This is illustrated by cuts which complete all that is needed to its comprehension, and which confirm the impression, made by the text, of its simplicity and value.

In treating of syphilitic strictures, the author expresses himself as a dualist, and distinguishes clearly between the local lesion, chancroid, and the initial lesion of the constitutional disease, syphilis. He accepts, as showing the tonic properties of small doses of mercury, the investigations of Keyes and others, who found the red blood-corpuscles to be increased in number by their use. We must not be too fast in adopting this conclusion, however; for more recent experiments make it doubtful whether the number of the red corpuscles is always a reliable index of the state of health. It may be true, but we are not quite sure of it yet.

Turning to the subject of the formation of urinary calculi, we find a very good exposition of the subject; but cannot but feel that it would be

better if the author were familiar with the investigations of Ultzmann, of Vienna. For the removal of calculi by cutting, the author rejects every method but that of Cheselden, the left lateral operation. He dismisses the supra-pubic operation without grace. For which we would like very well to have a word with him; but we cannot give time or space to it now. Of Bigelow's operation of litholapaxy he says, "An increasing experience in this mode of operating leads me to believe that Dr. Bigelow's practice will materially add to our resources for the treatment of stone."

When treating of tumours within the bladder, the author calls attention to the possibility of exploring this viscus by "rectal palpation," after the plan suggested by Simon. That this method may not always give reliable results may be inferred from an occurrence witnessed by the writer of this review, while assisting in an operation of perineal lithotomy. The operator having failed to find the stone, after repeated and fruitless attempts to discover it, a bystanding surgeon bared his arm and thrust his hand far up the rectum. The thoroughness of his exploration he demonstrated by protruding the wall of the abdomen upon his fingers. He declared there was nothing between his hand and the walls of the pelvis, and asserted positively there was no stone in the bladder. Another surgeon, then present, would not, even on this testimony, give up, and a happy movement of the forceps soon discovered a stone, which, being drawn out, was found to be almost the size of a small egg.

The author shows a creditable familiarity with the English and American literature of his subject, and makes a few references to Continental surgeons. It is surprising to an American, meeting the names of Gouley, Otis, Keyes, etc., to miss that of Gross. The author might also learn from the books the methods of treating exstrophy of the bladder used by Maury and Bigelow.

In conclusion, we would heartily commend the agreeable style, the moderate tone, the instructive suggestions of the work. It is a credit to its author, and ought to prove useful to any reader. Nevertheless we must say that we think its value would be increased if it were made more systematic and less colloquial. At the same time care might be taken to describe all the instruments figured, and all the important operations referred to. The "plates" might be left out without defrauding the artistic side of the reader's nature, and words like "twizzling" might be translated into good English for the benefit of Americans. C. W. D.

ART. XXX. — *Anatomical Studies upon Brains of Criminals. A Contribution to Anthropology, Medicine, Jurisprudence, and Psychology.* By MORIZ BENEDIKT, Professor at Vienna. Translated from the German by E. P. Fowler, M.D., Department of Translation, New York Medico-Chirurgical Society. 8vo. pp. 185. New York: Wm. Wood & Co., 1881.

AT this time, when the case of Guiteau is awakening world-wide attention, a monograph on the brains of criminals cannot fail to be of interest to physicians and criminalists. The psychology of crime, and the responsibility of criminals are, indeed, questions which are daily becoming of graver importance to science, society, and the law. The memoir of Bene-

dikt is a valuable contribution towards the scientific solution of these questions. It embodies a large amount of work. The author launches forth with an endorsement of the doctrine, as old as Erasistrates, that man thinks, feels, desires, and acts according to the anatomical construction and physiological development of his brain. He affirms his belief that the proposition of Erasistrates has received continually increasing support through the increasing knowledge of the brain and its bony cask; and the main object of his research is to ascertain whether the criminal class does not furnish data which testify in favour of this proposition. He seeks to determine, by an examination of the brains of criminals, the anatomico-physiological explanation of the great truths, which are well put in the following quotation from his preface:—

"*An inability to restrain themselves from the repetition of a crime, notwithstanding a full appreciation of the superior power of the law (society), and a lack of the sentiment of wrong, though with a clear perception of it,* constitute the two principal psychological characteristics of that class to which belongs more than one-half of condemned criminals.

"A consideration of no less importance is the fact that the same defect of moral sensibility and will may remain concealed by superior mental organization and greater dexterity in criminal contrivance, or it may be obscured through complications with mental disorder."

Two types of brains are described by Benedikt. The first is the normal type with the typically separated fissures, that which is described and pictured in the works of Ecker, Charcot, and Ricket. The second is the type of confluent fissures. "The most important characteristics of this type consists in this: *If we imagine the fissures to be water-courses, it might be said that a body floating in any one of them could enter almost all the others.* There are also absent a great number of annectants, which are important cerebral territories, the absence of which represents so many aplasias." Benedikt believes that he has discovered that the brains of criminals belong to this second type. His conclusions are drawn from the results of observations, apparently made with care, upon brain specimens from twenty-two criminals. They are, therefore, not to be lightly set aside. According to him, "criminals are to be viewed as an anthropological variety of their species, at least amongst the cultured race." Valuable observations are recorded on the relations of the cerebellum to the cerebrum, and on certain "animal similarities" to human brains of low grade.

Our own studies of the human brain have been chiefly made at the Philadelphia Hospital, many of the pauper patients of which institution constitute the same sort of material as that referred to by Benedikt as approaching the criminal type, those who have suffered complete shipwreck in life through a low grade of intelligence, imperfect motor development, or through crimes and vice; for instance, inebriates, epileptics, prostitutes, etc. Independently of any knowledge of Benedikt's researches, we have ourselves frequently observed and called the attention of our classes to the unusual and peculiar development of cerebral fissures in many of these cases. The views of Benedikt are, however, of an importance too far reaching to be precipitately adopted. C. K. M.

ART. XXXI.—*Report of the Medical Missionary Society in China for the year* 1880. 8vo. pp. 28. De Souza & Co., Hongkong, 1881.

THE forty-second annual meeting of this society was held in Canton on the 20th of January, 1881, and the chief interest in its series of yearly reports centres in the work done in the Hospital of Canton, under Drs. Parker, Kerr, and Carrow. The society was organized at Canton, February 21, 1838, three years after the opening of the Ophthalmic Hospital of that city by Dr. Parker, who is still living, being now a resident of Washington, D. C. To the late Drs. James H. Bradford and Coxe, of Philadelphia, belongs the credit of initiating the practice of western medicine in Canton, they having opened a dispensary in 1828, which was so largely patronized by the natives, that the health of Dr. Bradford gave way under the effects of the labour and climate, and he was forced to abandon the project, and return home. He was the Port Physician of Canton for three years, and took a very great interest in his dispensary work, which was an additional voluntary labour on his part. The present general hospital, under the supervision of Dr. John G. Kerr, is a gradual growth of the work of the Missionary Society and its able medical superintendents. Dr. Parker having the advantage of a vigorous constitution, continued in even more active service down to 1854, when he was succeeded by Dr. Kerr, who has been in charge ever since, with the exception of the years 1876, '77, and '78, when Dr. Carrow relieved him, he has therefore had a Chinese hospital experience of about twenty-five years.

The *out-patients* (prescribed for mainly on Mondays and Fridays) for the year 1880, numbered 16,860, of whom 3095 were females; and the *in-patients*, 1121, 772 males, and 349 females. The chief operations performed were, removal of urinary calculi 48, 26 by lithotomy, 13 by lithotrity, 7 from the urethra and 2 from the prepuce. Of the lithotomy cases, 3 died; and of the lithotrity, one. Removal of cancerous (30) and other tumours, in all 65. Extraction of cataract 41, and division 8, or 49 in all. Ovariotomies 4, 2 fatal. Amputation of arm 1, toes 2, penis 2. Operation for entropium 129, and pterygium 13.

As the native physicians, except those educated in the hospital, never practise minor surgery, a very large proportion of the surgical cases belong to this class, such as opening of abscesses, 155, etc.

Dr. Kerr had at one time nearly abandoned the operation of lithotrity, as it was quite as fatal as lithotomy, and much more tedious; the lithotomy cases averaging only seventeen days in recovery; the improved method of Dr. Bigelow, which Dr. Kerr characterizes as "one of the greatest improvements of modern surgery," has caused a revival of the crushing operation; and in all the cases given, except two, the stones were removed at one sitting. Preputial calculi are so common among the Cantonese, that they have been removed in large numbers by the operation for phymosis, and the collection of specimens in the hospital is thought by Dr. Kerr to be the largest in the world.

Entropium is so common an affection with the Chinese, that the operation for its relief has been performed in some years, on an average, more than once daily. *Ectropium* is a much less common malady. The operations for the former appear to have been much less numerous than in some previous years.

Ovariotomy was performed four times within the year by Dr. Kerr,

with a favourable result in two cases. Previous to 1880, there were but two operations, one incomplete, by Dr. Kerr, and one complete, by Dr. Young, of Hongkong. The former was the first attempt of the kind in China, and failed in consequence of extensive adhesions. The woman recovered from the effects of the incision, the case of Dr. Young died. The successful operations were performed upon two women, 26 and 33 years old respectively; and the tumours removed weighed 38 and 49 pounds.

Necrosis is much more common in China than here, particularly of the jaws, as the native physicians do not extract decayed teeth, and disease extends from them to the bones.

Early in the history of the Canton Hospital, it was designed to make it ultimately the "Canton Hospital Medical College," and to this position it is gradually approaching. The Chinese pupils are instructed in anatomy and the practice of medicine, by Dr. So-To-Ming; in materia medica by the senior pupil, Lo-Shun-chi; and in chemistry and clinical medicine, by Dr. Kerr. The death of Dr. Fun Wong, Dr. Kerr's chief hospital assistant, has reduced the hospital staff and faculty. When a full corps of professors for all the branches is obtained from the graduates, the college will be formally organized. Women are now being educated as midwives.

R. P. H.

ART. XXXII.—*A System of Surgery, Theoretical and Practical, in Treatises by various Authors.* Edited by T. HOLMES, M.A., Cantab. First American, from second English edition, thoroughly revised and much enlarged, by JOHN H. PACKARD, A.M., M.D., assisted by a large corps of the most eminent American Surgeons. In three volumes. Vol. I. 8vo. pp. 1007. Philadelphia: Henry C. Lea's Son & Co., 1881.

NOTWITHSTANDING the many and important additions to the list of surgical books during the past ten years, the need of a standard work of reference has asserted itself more and more strongly as the freshness of the edition of Holmes of 1870 began to fade. No better evidence of the growing activity of surgical science in this country could be afforded than the appearance of an American edition in the field. Such an event is worthy of special note as marking a new era in our medical literature in which American authors will undoubtedly assume a much greater prominence than they have hitherto occupied. The selection of Dr. John H. Packard, of Philadelphia, for the responsible task was eminently appropriate, and one upon which the publishers have every reason to congratulate themselves. The present volume, although containing much that has already been noticed in these columns, has many features in the old as well as the new text which it may not be inappropriate to take this opportunity to allude to.

It would be difficult to determine precisely upon what basis the author of a treatise on surgery may have arranged the order of his subjects. It is quite evident that surgical writers are in no way subservient to routine, and that individual tastes, or what is more likely, the exigencies of authorship and publication frequently prevail over a scientific classification. There appear, however, to be no special difficulties in following the latter method. There can in the main be but one which would lead the student,

as the novelist does his reader, from one page to another in the story of surgery, each chapter serving as a preparation for the one which is to follow. The study of regional or operative surgery is manifestly of little value without a previous familiarity with the principles which govern morbid processes in general; a study of nutrition and inflammation with all its varieties and complications, paves the way for an intelligent understanding of certain constitutional diseases, as syphilis or even of tumours. Having thus disposed of general pathology, the student is prepared for special studies of diseases and injuries of tissues and regions, and it is not until he has mastered all these that he is fit to be entrusted with the responsibilities of operative surgery. Although, in a general way, this plan has been adopted in Holmes's Surgery, there are certain departures from the rule for which we find it hard to account. The complete separation of the chapter on pathology of wounds from those on inflammation, the indiscriminate distribution of pyæmia, hectic fever, and allied processes in different portions of the volume, the treatment of such subjects as abscess and ulcers as special morbid processes in a chapter immediately following tumours, are features which betray an insufficient appreciation of the great advantages of a thorough scientific arrangement, not only to the beginner but to one who might wish to inform himself of the bearing of modern progress in science upon any or all of these branches of one subject. We have always felt that the separation of injuries from diseases of given localities was a great defect in the arrangement of the work, entailing incompleteness or repetition in corresponding parts and great inconvenience to the reader. Such changes of position which have been made in the present edition we are, with one or two exceptions, not inclined to regard as improvements. One great difficulty inherent in the present undertaking, which to an editor must have been an unpalatable condition, was the necessity of leaving the old text as it stood. It is greatly to the credit of Holmes's staff of writers that their articles have sustained so well the test of time, and yet it is often painfully apparent to the careful reader that the scissors could have been plied more effectively than the pen.

The volume opens with the article on inflammation, by Dr. Burdon Sanderson, which, owing to many important observations in this department of surgical pathology, carried on at the time of preparation, was deferred to the last volume of the former edition. There is therefore less to be added than one might have expected in so important a department of pathology and one so constantly the subject of investigation. One familiar with this kind of work cannot fail to be impressed with the apparent freshness of the article in which in these rapidly moving times a decade would ordinarily suffice to betray the marks of age. One does not perhaps get all the satisfaction one may seek in the explanation of the disorders of the circulation in inflammation, the writer being content to group together some of the more important experiments bearing upon the innervation of the bloodvessels than to frame theories that might prove more satisfactory to the average reader. A brief summary of physiological work in this field would have been a valuable addition by the reviser.

The history of the passage of leucocytes through the walls of bloodvessels is so complete that the only addition which Dr. Simes finds to make is the suggestion that the distension of the vessel-wall causes a separation at many points of the cellular cement substance, and that it is

through these so-called stomata that corpuscles migrate. One noticeable feature of Sanderson's views is the very decided ground which he takes in favour of the activity of the fixed connective-tissue corpuscles, particularly as illustrated by the behaviour of the corneal corpuscles in the earliest stages of traumatic keratitis; also, the fixed corpuscles of the sheath of muscular fibre, the epithelium of the conjunctiva where the young cells are supplied from the cells of the part by an endogenous growth, some of them actually escaping from a formed cavity in the parent cell by virtue of its power of amœboid movement. Dr. Simes also shows that a similar germinative process may be observed in the endothelium of veins, in the epidermic layers of the skin and elsewhere.

The difficulty connected with an attempt to revise so great a work on the plan adopted in this edition is apparent when we turn to that portion of the process of inflammation which has been handled by Mr. Simon. The changes necessary in the second edition had already left the subject in a somewhat involved state, which has become more apparent now that the new and the old are brought within the limits of the same volume. Much of Mr. Simon's pathology, although penned by the hand of an able writer, belongs to an era that has passed, and could well have been omitted, while its retention by the reviser appears to give it his indorsement. One who has attempted for the first time to conquer the intricacies of the various theories bearing upon the inflammatory processes would, we think, soon become lost in hopeless confusion. It is somewhat discouraging, after groping about in this chapter, to feel that the force of all that one has been reading is invalidated by some such statement as the following: "When pus accidentally passes up the vein of an extremity . . . and give rise to the multiple suppurations which are so characteristic of pyæmia." It would be a consolation to have been rewarded by the reviser with a summary of what has been done up to date in the study of the relations of organisms to disease, particularly in view of the impetus which this branch of study has lately received. The existence of great confusion in prevailing theories is, we think, hardly a sufficient excuse for its omission. The concluding chapter on the treatment of inflammation contains much that is interesting to the student, but in its practical aspect partakes somewhat too largely for the present day, or perhaps it might more appropriately be said for this country, of mercurial and antiphlogistic modes of treatment.

Similar criticisms can be made on the chapters on the surgical fevers, although Dr. William Hunt has not felt called upon to make an addition to them. We find no preliminary observations on the pathology of fever, if incidental allusions in the article on inflammation are excepted. We are ushered immediately into an account of "hectic" fever, the very term selected betraying an ignorance of its true pathological character. We are informed that this variety of fever occurs "when a local disease . . . maintains an habitual state of febrility." No comparison is drawn between this and those forms of fever which persist as an accompaniment of excessive suppuration in wounds. Nor is any distinction made between the latter and common traumatic fever, which is also described. Mr. Croft alludes both to septicæmia and pyæmia, yet in the article on pyæmia, by Mr. Callender, we find no allusion to the former variety. As a form of septic fever, distinct in its clinical symptoms and pathological changes from pyæmia, and recognized as a separate variety by the most eminent pathologists of the day, it certainly deserves mention. Un-

doubtedly our knowledge of the whole subject of septic poisoning is in a transition state, and time will bring about many and perhaps greater changes in our views of these diseases even than the last few years have developed, but this does not preclude an attempt to present the subject in a form more in accord with modern views. The description of pyæmia includes the embolic theory, which is fairly given; there is a long argument to show that pus does not find its way into the blood, but we fail to discover that any space is devoted to the etiology of this disease, or allusions to putrefactive changes in the wound, the presence of organisms or ferments, nor is there any mention of that characteristic symptom of the disease—recurring chills, or the still more characteristic variations of temperature, as shown by very frequently repeated thermometric observations. The names of these affections were upon the lips of nearly every citizen of the United States but a few months since; physicians were sorely pressed for information; we fear very few of our colleagues bred on English, and we might also venture to add American, text-books succeeded in shedding much light upon the subject.

The chapters on tumours were originally written by Sir James Paget, and in the second edition were revised by Mr. Moore. Dr. Longstreth has undertaken the difficult task of bringing the subject into a shape that will correspond with the prevailing views of the day. His additions are necessarily frequent and lengthy, but the difficult, and somewhat delicate, task has been most satisfactorily accomplished. His work has a special value, even to specialists in this department of science, giving the latest views on all debatable questions. There are one or two points on which we should disagree with the author, such as his inclination to ally keloid (a typical fibroma) with sarcomatous growths, but these are few and far between. It is especially interesting to compare the teachings of to-day with the views of so great a master as Sir James, with whose nomenclature and classification most surgeons near the meridian of life are still familiar. In these chapters, those who are still struggling to keep pace with the science of the day, have a peculiarly favourable opportunity to compare the new with the old, to identify many an old friend in his modern dress. The chapter on the microscopic structure of tumours is arranged with woodcuts in a manner particularly convenient for reference, and has been greatly improved by the addition of a number of illustrations by Dr. J. H. C. Simes.

The second half of the volume is chiefly devoted to regional injuries, and it is in this department that we find the great school of surgery for which England is famous, and to which the system owed its justly-earned reputation, appearing to the best advantage. Dr. Packard has appropriately selected the chapters on fractures and dislocations for his own personal revision. These comprise general remarks only on the subjects in question, the study of special injuries of this nature being deferred to the chapters on injuries of the extremities. We are glad to notice that the editor enters his protest against the custom of "developing" the existence of crepitus, a caution which books usually fail to dwell sufficiently upon, and for the lack of which much needless injury has been inflicted by zealous practitioners. For similar reason we cannot quite agree with the advice given further on in regard to the necessity of passive motion from an early period in the treatment of fractures. The remarks by Mr. Hornidge are excellent, particularly those which explain the causes of non-union. We do not find mention of silver sutures for these cases,

except the statement that in compound fractures sutures are dangerous. The experience of hospital surgeons to-day would hardly support this view: they are excellent in compound fractures with great displacement, but we have sometimes felt that necrosis has been encouraged by their use, and the final healing of the wound delayed somewhat. Dr. Packard could have done well to allude to their use at least in ununited fractures.

The article on tetanus, by Mr. Poland, with additions by Dr. Jewell, is of the highest grade of excellence. The latter is disposed to regard the myelitis, with its destructive changes, as is shown in the plates which accompany the article, as an incident rather than an essence of the disease, which is an irritative lesion of a systemic character of the gray matter of the spinal axis, the exalted reflex excitability being due to a removal of inhibitory influences emanating from brain centres. In respect to etiology, we do not see it mentioned that the disease may appear simultaneously in a sufficient number of cases to suggest an epidemic character. Chloral seems to be his favourite remedy.

The chapter on delirium tremens, by Mr. Barclay, with notes by Dr. Bartholow, is a good companion piece.

The volume closes with the series of chapters on injuries of regions too well known by surgeons as standard references for us to dwell upon them at length. The rich materials stored up in the museums and records of the great London hospitals are here given to the world, and it will be many a long day before the precepts therein contained will become simply of historic value to the surgeon. The names of Hewitt, Pollock, Birkett, Flower, and others, are sufficient guarantees of the work they contain. Taking that on injuries of the back, by Alexander Shaw, we find an exemplification of the great clinical experience of these writers. That portion devoted to sprains of the back, the description of which is most satisfactory, is particularly rich in clinical illustrations. The author, however, does not escape the common fault of giving his cases too much in detail—a contrast to the neat French method of condensing such material into a graphic series of concise "*observations.*" The least satisfactory part of this chapter is that devoted to concussion, the author taking what to-day would generally be considered altogether too narrow a view of the subject. We fail to find mention by Dr. Hunter of valuable contributions to this subject by American authors, such as the articles on so-called concussion of the spine, by Dr. R. M. Hodges, or of the monograph of Dr. Ashhurst under fractures of the spine. It is curious to observe the apparent preference of the revisers for European authority, which is to be attributed in part to the very imperfect means, hitherto existing, of getting at the work of native writers owing to the peculiar character of our system of supporting periodical literature.

The publishers' work is highly creditable, and is in striking contrast to the style in vogue in this country when the system first appeared twenty years ago.

The double column, although not quite so comfortable to the eye, gives great compactness to the volumes, thus making them more convenient for reference, as does also the unusual luxury of an index for each volume and one also for the whole book. J. C. W.

ART. XXXIII.—*Supplement to Zeimssen's Cyclopædia of the Practice of Medicine.* Edited by GEORGE L. PEABODY, M.D., Instructor in Pathology and Practice of Medicine, College of Physicians and Surgeons, N. Y. 8vo. pp. 844. New York: William Wood & Co., 1881.

THE publication in Germany of a second edition of Ziemssen's Cyclopædia and the lapse of time since the appearance of the earlier volumes of the American translation of the work, have rendered necessary in the opinion of the publishers of the latter, the issuing of a supplemental volume in order "to remove from it the few traces of time that the last few years have produced." The preparation of this volume for the press has been committed to Dr. Peabody, who has been ably assisted in his work by a large corps of collaborators, twenty-eight in number. In the list of these will be found the names of several physicians who have distinguished themselves in different departments of medicine, as for instance, Drs. J. Lewis Smith, Robert E. Weir, and George M. Lefferts, of New York; Drs. Reginald H. Fitz, James J. Putnam, and Edward S. Wood, of Boston; Dr. J. Solis-Cohen, of Philadelphia, and Drs. James Nevins Hyde and Henry M. Lyman, of Chicago. In particularizing these gentlemen it is not our wish to be understood as thinking that their contributions are the only valuable ones or even that they are of superior excellence to those of some we have not mentioned by name.

It is difficult within the limits of a brief notice, such as the present, to give such a conception of the scope of the work as will enable our readers to form any idea of its value. "It has been the aim of the writers to give a concise account of the progress made in the various departments of medicine during the time that has elapsed since the several volumes of the Cyclopædia were published, each of the subjects treated being brought up to the date of the present volume." So that the volume, independent of its connection with the Cyclopædia, has a value in that it contains in a convenient form for reference, together with a full bibliography, an epitome of the recent advances in medical science. It would be impossible without overrunning the space at our command to allude to the subjects of the various contributors even by name. We shall therefore not attempt to criticize them in detail. Among the most important of them is one by Dr. Frederick C. Shattuck, of Boston, on *Diseases of the Lungs.* In the section on croupous pneumonia, this writer fully considers the theory that pneumonia is an infectious disease, which was advocated by Jürgensen in the article on this disease in the fifth volume of the Cyclopædia, and which is also held by Dr. Flint, but does not adopt it as applicable to all cases, since the conclusions he reaches he expresses as follows: "Pneumonia is often simply an inflammatory disease, but may depend on various miasmatic influences, and then presents decided variations in its course and symptoms." In the course of his paper he refers to several epidemics of pneumonia of a typhoid character, which evidently originated in defective hygienic conditions. One of these occurred among the prisoners in the jail at Frankfort, Kentucky, and is reported by Dr. Rodman in the number of this Journal for January, 1876. The occurrence of pneumonia cannot always be explained in this way, and we are not therefore prepared to adopt unqualifiedly the views on

this subject of Drs. Jürgensen and Flint. Dr. Shattuck also discusses at some length the *Climatic Treatment of Phthisis*, and in the course of his remarks takes occasion to call attention to the importance in recommending any particular health resort of paying some attention to the personal peculiarities and preferences of the patient. This is a subject which is often overlooked by the physician to the disadvantage of the patient. It is certainly one which is not alluded to by many writers on phthisis, who recommend the Riviera or Davos, according to their individual preferences.

The arrangement as to bibliography, captions, paragraphs, etc., in this volume are essentially the same as in the original work. J. H. H.

ART. XXXIV.—*Comparative Embryology.* A Treatise by FRANCIS M. BALFOUR, LL.D., F.R.S., Fellow and Lecturer of Trinity College, Cambridge. In two volumes. 8vo. pp. xi. 492, xxii., xi. 655, xxii. London: Macmillan & Co., 1881.

THE vigour with which the study of Embryology has been pursued during the last few years, has led to the introduction of many conflicting statements and incomplete observations; to attempt to arrange these in anything like an orderly or systematic exposition has been no easy task. Mr. Balfour, however, who is well known as one of the authors of the best manual on Embryology with which we are acquainted, and of an elaborate monograph on the Elasmobranch fishes, as well as of numerous other valuable papers, has succeeded in bringing order out of chaos to a degree that is very satisfactory.

Vol. I., with the exception of three admirable chapters on the Ovum and Spermatozoon, the Maturation and Impregnation of the Ovum, and the Segmentation of the Ovum, is limited to a description of the development of the Invertebrata. In the second volume, the first eleven chapters deal with the developmental history of the chordata. These are followed by three comparative chapters completing the section of the work devoted to Systematic Embryology. The remainder of the treatise, from chapter XIV. onwards, is devoted to Organogeny, the history of the development of the organs of the chordata being treated, as the state of our knowledge necessitates, with much greater detail than that of the other groups of metazoa.

With the exception of a small, but useful, book by Packard on Comparative Embryology, Balfour's treatise is the sole work on this subject with which we are acquainted: in it the student will find, clearly arranged, all the results of the most modern research, enriched by Mr. Balfour's own valuable work, and subjected to his critical analysis. R. M. S.

ART. XXXV.—*Klinische Darstellung der Krankheiten des Auges, Zunächst der Binde-, Horn-, und Lederhaut, dann der Iris und des Ciliarkörpers.* Von Dr. FERD. RITTER VON ARLT, o. ö Prof. der Augenheilkunde in Wien. Wien. 1881.

Clinical Exposition of Diseases of the Eye—Conjunctiva, Cornea, Sclera, Iris, and Ciliary Body. By Dr. F. VON ARLT, Prof., etc. Vienna, 1881, p. 316.

THE welcome with which this volume will be received must be somewhat saddened by the thought that it is probably the last that will come to us from the hands of the great master. The fact that he has issued this fragment in advance is an evidence that he himself has had some such thought, and was not willing to leave a promise to his many pupils wholly unfulfilled. We can only express a fervent hope that Time, which seems to have dealt so kindly with him, may spare him to us yet long enough for the completion of the work begun so worthily, both for him and for the special branch of medicine he has done so much to advance. When we remember that Von Arlt was the teacher of Gräfe, and was a professor at the time Helmholtz invented the ophthalmoscope, it becomes apparent that he has lived and worked in an exceptionally fortunate period —one of such activity as will probably never occur again. The volume before us contains, in part, the results of the unusual experience of such a life. It is designed, he tells us in the preface, for the use principally of the general practitioner, but the experienced specialist will find much in it that will furnish food for reflection. The same qualities of close observation and careful study of the relations of symptoms, and particularly the etiology of each affection, which have won him renown as a clinical teacher, are made manifest here. Nothing is so apparently insignificant as not to receive careful attention, and that an affection is common seems to be to him the more reason for dwelling upon it in all its details of symptoms, etiology, diagnosis, and treatment. The fact which will strike one most forcibly in reading the book is, that it is wholly the outcome of the writer's experience. The views set forth are almost without exception his own, though the labours of others are by no means passed over in silence. It is just the difference between *writing* and *compiling* a book, and the former is what we look for from Prof. Arlt. The opinions enunciated are not in all cases those most generally accepted, but when they thus differ from the current belief, the grounds for the author's views are always set forth with distinctness.

The first 106 pages are given to a consideration of the diseases of the conjunctiva, and the first affection treated of is simple catarrhal inflammation. As is well known, one of the most distressing symptoms of this affection is the sensitiveness of the eyes to artificial light. Prof. Arlt thinks this is due to the *heat* which accompanies the rays of all artificial light. This is, we think, to say the least of it, highly problematical. Certainly the same amount of heat unattended with the light does not produce the same uncomfortable sensation. Under this head consideration is given to a peculiar form of eye trouble, of which we find no mention in the writings of American or English ophthalmic surgeons. It is the *Frühjarhskatarrh* of Sämisch. As it is by no means a rare affection, and has some very marked characteristics, we will be pardoned a more than passing allusion

to it. Its chief characteristic is the presence of a circumcorneal elevation of a yellowish-gray colour—1 to 3 mm. in breadth, encroaching more or less on the surface of the cornea itself. Its thickness varies from ½ to 1 mm. It occasionally occupies the whole extent of the limbus, but more frequently only a part of it; sometimes as almost circular elevated masses, but often having an extent of 5 to 10 mm. The conjunctiva of the ball is usually free from injection, while the conjunctiva of the lids is always infiltrated, and has a succulent look, and is studded with papillary elevations, sometimes very fine, but sometimes quite large and flat. In the negro I have observed a peculiar discoloration of the ocular conjunctiva occupying principally the palpebral opening. It is a dirty-brown, resulting from a deposit of pigment in the conjunctival tissue, and is deepest in colour at the base of the elevated masses. This has not heretofore been described, and as I have not seen it in the cases of the disease I have observed in the white race, I am disposed to regard it as peculiar to the negro. The symptoms of this affection are almost identical with those we find in severer cases of hyperæmia of the conjunctiva. There is no excessive pain, but whenever an attempt is made to use the eyes, there are more or less disageeable sensations, as itching, burning, etc., so that any continuous work is, as a rule, impossible. The lids may or may not be gummed on awakening in the morning, but almost without exception, at some time during the course of the affection, there arise all the symptoms of a catarrh of the conjunctiva. The other peculiarity of the affection is its recurrence at the appearance of warm weather. During the winter the symptoms subside, or, it may be, disappear, to make themselves manifest again in the spring—hence the name given it by Sämisch. It is likely to do this for a number of years—sometimes as many as eight or ten. As the name Spring Catarrh is in no way descriptive of the condition, and is to a certain extent incorrect—as it occurs in the summer months as well—we think the name *circumcorneal hypertrophy of the conjunctiva* a more appropriate one for it. As regards treatment, nothing yet suggested has seemed to exercise much influence on the course of the disease. Mild astringents, and protection of the eyes from glaring light by means of blue or gray glasses, seem to be the agents called for on the part of the eye itself. As there seems to be some similarity in the pathological appearances of this and psoriasis, the administration of arsenic appears called for. Wecker recommends the arsenite of soda in doses of 2 milligrams three times a day.

Under the division of *chronic blenorrhœa* he treats of *ophthalmia Ægyptica*, *militaris*, *contagiosa*, *granulosa*, or *trachomatosa*. He looks upon all these as simply forms of a chronic suppurative inflammation of the conjunctiva. In this opinion, we think it may be said, Prof. Arlt stands alone. So far as we know, no author or clinician of repute considers trachoma anything else than a specific disease. It is attended, it is true, by a conjunctivitis of greater or less severity, but in its course and results it differs in many important particulars from the blenorrhagic form of that disease. On the other hand, he considers the catarrhal and blenorrhagic forms of conjunctivitis as quite distinct. He has never observed a blenorrhœa of the conjunctiva begin as a catarrhal inflammation. In regard to the etiology of trachoma, he says: "I hold that the so-called granular lids is not a disease *sui generis*, but only a modified blenorrhœa, a disease which, originating from the transfer of the mucous secretion from the genitals to the eye, has, in its progress from eye to eye, and from individual to indi-

vidual, lost some of its original virulency, but gained in persistency, and can again, under unfavourable external circumstances, reach its former degree of intensity" (p. 49). The proof which he offers in support of this is more circumstantial than direct, and cannot, in our opinion, be convincing to the majority of observers who have had much to do with this most intractable affection. It has been shown by several investigators—Nettleship among others—that in many eyes at the time, and for all time previously, free from any purulent or even mucous discharge, there were to be seen the trachoma granules, which needed but the application of some exciting cause—the contagium of a blenorrhœa or the like—to develop into true granular ophthalmia. The fact, too, that it attacks some races with great virulency—as the Irish—and spares others—as the negro—would tend to establish the existence of something like a dyscrasia as distinct from a common externally acting cause. The temptation to a further discussion of the question is great, but we forbear, because, practically, all are agreed that the discharge from a trachomatous eye—at least in its earlier stages and during the exacerbations—is infectious, and that patients should, if possible, be isolated; and where this is not practicable, great care should be exercised to prevent a further spread of the disease by contagion. In regard to treatment he has nothing new to offer. He recommends the usual astringent applications to be made, except where there is such a high degree of reaction as to call for the pure antiphlogistic agents. In the treatment of the pannus, which is one of the most unfortunate results of the affection, he confesses to a want of experience in the operation of peritony which some other surgeons have found so efficacious.

Under the head of *Conjunctivitis scrofulosa sive lymphatica*, he treats with great minuteness of detail one of the most common affections of the eye. By this name he designates all those affections which have usually been classed under the names of *C. pustulosa*, *phlyctenulosa*, *herpes*, etc., and which affect the epithelial layer of the cornea, as well as the conjunctiva. In fact, through the whole work we see a tendency to classify diseases not so much by their pathological conditions or according to anatomical divisions as by their supposed origins or causes. This form of nomenclature has its advantages when viewed from a therapeutical standpoint, and in these days of active pathological investigation is probably too much neglected. But in this particular instance Prof. Arlt claims that he has adhered to the anatomical division in so far as to consider the epithelial layer of the cornea a continuation of one layer of the conjunctiva, and in this form of disease it is the epithelium alone which is involved. In treatment, in addition to constitutional measures, he uses always some form of mercury as a local application—either in the form of dry calomel blown on the cornea or into the lower cul-de-sac—or Pagenstecher's ointment rubbed into the eye. When there are much pain and lachrymation, preference is given to an ointment of belladonna and ung. cinereum rubbed on the brow and around the eye, rather than to a solution of atropia dropped in the eye itself, since the great flow of tears will carry it away before it has had time to produce any effect.

We had noted several points under the head of *keratitis* for mention, but our allotted space is almost filled, and we can call attention to only a few additional ones. He makes a distinction between interstitial keratitis and keratitis *ex lue hereditaria*, though the only distinctive character of the latter is the demonstration of an existence of the specific taint. He does not look upon Hutchinson's teeth as a pathognomonic sign. He says there

are many cases of congenital syphilis in which the peculiar notched incisors are not met with. He mentions keratitis from intermittent fever, though only a few cases have fallen under his observation. He does not note the clearly outlined ulcer near the centre of the cornea, which has been described by Kipp, of Newark, and which seems to be the most common form of the manifestation of malarial poisoning in the cornea.

We have no space left to notice the section devoted to the sclera, iris, and ciliary body; but they are as full of the same calm judgment, the same careful analysis of symptoms and accurate observations as regards cause, course, and treatment, as the others. Hardly a page can be read, even by a specialist of large experience, which will not be suggestive of ideas fraught with practical good. We sincerely hope it may be our good fortune to review in these columns the completion of this work so admirably begun.

S. M. B.

ART. XXXVI.—*A Practical Treatise on Impotence, Sterility, and allied Disorders of the Male Sexual Organs.* By SAMUEL W. GROSS, A.M., M.D., Lecturer on Venereal and Genito-Urinary Diseases in Jefferson Medical College of Philadelphia, etc. 8vo. pp. 174. Philadelphia: Henry C. Lea's Son & Co., 1881.

THE author in his preface states that his "aim has been to supply in a compact form practical and strictly scientific information especially adapted to the wants of the general practitioner in regard to a class of common and grave disorders." . . . And we may be permitted to congratulate him on the excellent manner in which he has compassed this end.

Whatever exceptions criticism may find to make, and these after all are on minor points, the fact remains that the book contains sound advice upon important subjects clearly, accurately, and pleasantly given. Indeed, this is apparent from the start in the statement boldly advanced, that in cases of unfruitful marriages the husband should also be examined, inasmuch as "he is, as a rule, at fault in at least one instance in every six," a point which has been almost overlooked by too many surgeons, but which, nevertheless, should be borne in mind.

The book is divided into four chapters headed Impotence, Sterility, Spermatorrhœa, Prostatorrhœa, and these again into sections for greater convenience. In the first of these chapters, in discussing the etiology of atonic impotence, the writer lays stress, and very properly too, upon its frequent association with strictures of the urethra either with or without a chronic inflammation of the prostatic urethra. The cause of these strictures being due to masturbation, although not a new idea, is one which has been comparatively lost sight of, and to which we are glad to see Dr. Gross call attention, although we incline to the belief that many of these strictures are spasmodic in their nature, due to the urethral irritation and not to any true pathological change in the canal itself induced by the habit.

The author classifies the atonic variety of impotence under the three heads of—

1st. Where the erection is imperfect and of short duration, and ejaculation is frequently too precipitate, but sexual desire remains, and intercourse is possible though incomplete.

2d. Where erection is so feeble that intromission is impossible, or it is entirely absent. As in the preceding form, desire is present.

3d. Where not only is there loss of power of erection, but desire is completely abolished.

The first cause is more common than all the other causes combined.

The treatment of these cases, besides the use of the proper means for the relief of the mechanical causes, depends upon the free administration of the bromide of potassium, with or without quinia, which has been found to decrease the depression produced by the bromides.

In the section on psychical impotence Dr. Gross scouts the idea that this variety is induced in newly married men from fear of being unable to consummate the sexual act or from mortification in failing to accomplish it. To such a view we frankly take exception, and certainly two of the three cases given by him as illustration seem to militate against his sweeping disbelief of such a doctrine.

The section on organic impotence is full, and opens with a description of the various malformations of the genital apparatus which give rise to this condition of affairs. Among the diseases of the testes which operate in this direction, the author says that "bilateral syphilitic orchitis generally involves impotence,"—a statement too sweeping to be strictly accurate—involves sterility, would have been nearer the mark.

The chapter on sterility is an excellent one, and the author emphasizes his statement, made in the preface, as to the frequency of unfruitful marriages being due to the male. Sterility is divided into azoöspermism, where no semen or unproductive semen is secreted; aspermatism, where the spermatic fluid is not emitted; and misemission, where fertile semen is not deposited in the upper portion of the vagina.

Under the section on the abnormal conditions of the semen, among the many causes enumerated, which may induce this condition of things, the excessive use of morphia is given, together with the history of two cases from Rosenthal.

One of the most frequent causes of aspermatism, according to our author, is stricture of the urethra, which seems now-a-days to be the cause for nearly all the ills that mortal (genito-urinary) flesh is heir to, but in addition to this a tight phimosis is also credited with its share in producing this diseased condition.

The treatment in such cases is of course the removal of the disturbing cause, be it stricture or phimosis, and afterwards a tonic treatment, such as quinia, iron, strychnia internally, and cold sitz-baths with galvanism externally. For aspermatism from disturbances of the brain, nothing can be done in the way of medication, says our author, as it is entirely emotional.

The third chapter is devoted to spermatorrhœa, which is classified under the three heads of nocturnal, diurnal, and continuous. For this latter kind the author suggests the name of spermorrhagia. The causes are numerous, the most common one being a functional derangement of the nervous system, oftentimes the result of congenital predisposition. Masturbation is assigned as a very fruitful cause of the disease, although the statistical proofs given are not convincing, the evidence going to show merely that the patients had at some time of their lives masturbated, and not that a large proportion of masturbators were afflicted with spermatorrhœa. Gonorrhœa, by the way, is given as the cause in three out of seventy-five cases, a *post hoc, ergo propter hoc* method of reasoning. Our

old friends, urethral stricture and phimosis, again play an etiological part, together with herpes preputialis, a congenital narrowing of the meatus urinarius, and (in one instance) a polyp in the prostatic portion of the urethra, also epididymitis, piles, ascarides, fissures, pruritus, and the cauterization of internal hemorrhoids. Varicocele is one disease which our author excludes as playing a possible causative part.

The prognosis is good, indeed Dr. Gross states it "is far from being so unfavourable as many writers would lead one to believe."

The treatment, after all the possible mechanical causes have been removed, is by the internal use of sedatives and tonics. The one evidently preferred by the author is the bromide of potassium in thirty-grain doses, with ten drops of the fluid extract of gelsemium, every eight hours, and one-sixtieth of a grain of atropia sulphate on retiring.

Prostatorrhœa is the last subject discussed, and one noteworthy point made in a diagnostic view is the detection in the urine of delicate filiform shreds, "which are muco-purulent casts of the follicles and ducts of the prostate." F. R. S.

ART. XXXVII.—*History of Medicine in New Jersey, and of its Medical Men, from the Settlement of the Province to A.D.* 1800. By STEPHEN WICKES, A.M., M.D., Acting and Honorary Member of the Medical Society of New Jersey; Honorary Member of the New York State Medical Society, etc. 8vo. pp. 449. Newark, N. J.: Martin R. Davies & Co., 1879.

THE work is divided into two parts. The first part contains a history of the progress of the practice of medicine and some of its methods in New Jersey from its first occupation by Europeans, in 1623, till 1800; and, including an appendix of 39 pages, covers 121 pages of the volume. The second part consists of 294 "Biographical Sketches of New Jersey Physicians to A. D. 1800," alphabetically arranged: chronologically grouped, they might have possessed higher value for reference in the estimation of certain lovers of medical history.

In the early period of the colonies, the practitioners of medicine were chiefly clergymen, many of whom, conjecturing that they might lose their positions as clergymen, studied medicine in England before they embarked for their new homes. In New Jersey, both clergymen and "doctors" found it expedient and necessary to supplement their meagre income from the practice of medicine by engaging in farming, trade, and other pursuits as opportunity offered. The salubrity of the climate was praised by the early settlers, but it is stated that the Swedes, in Gloucester County, suffered from a disease called by the English fever and ague, which was ascribed by some to "the peculiar qualities of the air," but by most, to putrid and stagnant water in the swamps and morasses. It was treated with Jesuits' bark, root of cornus florida, the bark of liriodendron tulipifera, brimstone and vinegar, and geum rivale (water avens), which was claimed to be as efficacious as the Jesuits' bark.

Under the zealous recommendation of Cotton Mather, the practice of inoculation was begun in Boston, Mass., in 1721, whence it spread through the colonies. The first contribution to medical literature from New Jer-

sey was by the Rev. Jonathan Dickinson, a practitioner of medicine at Elizabethtown, who published an account of the "Throat Distemper" in *Zenger's Weekly Journal*, Feb. 16, 1735–6.

The New Jersey Medical Society, which was the first society of the kind in the colonies, was organized July 3, 1766. It established "a table of fees and rates," July 23, 1766, which is interesting to compare with modern charges for professional services.

In the appendix may be found a reprint of "Observations on that Terrible Disease vulgarly called the Throat Distemper, with Advices as to the Method of Cure, in a Letter to a Friend. By J. Dickinson, A.M. *Boston:* Printed and sold by S. Kneeland and T. Green, in Queen street over against the Prison 1740;" an extract from Salmon's Herbal, specimens of physicians' accounts, etc. etc.

We have found the volume interesting, and therefore commend it to the attention of those who find pleasure and instruction in the study of medical history generally, as well as to those who are interested in that of the beginning and progress of medical practice in New Jersey.

W. S. W. R.

ART. XXXVIII.—*Dysmenorrhœa, its Pathology and Treatment.* By HEYWOOD SMITH, M.A., M.D. Oxon., Physician to the Hospital for Women and to the British Lying-in Hospital. 12mo. pp. 122. London: J. & A. Churchill, 1881.

To the author of this little book dysmenorrhœa appears as a monster with multitudinous heads, which he spends his life in combating, and will continue to combat till he passes to "where the weary are at rest." From such a warrior, so earnest and untiring, we may expect much experience of value in our more desultory warfare.

"The weaker sex," he tells us, "is alone attacked by this malady, and it has no analogue in the male." Yet opinions may differ, and in the recent edition of Dr. Byford's "Surgical Treatment of the Diseases of Women" will be found a careful study of the analogies presented between certain troubles in the male and certain forms of nervous disease, including dysmenorrhœa, in the female, in which Dr. Byford certainly succeeds in tracing out a very strong resemblance.

The author rightly insists on considering dysmenorrhœa a symptom rather than a disease. He divides it broadly, according to its location and causes, into "ovarian,"—"tubal and from disease of the broad ligament," including under the last heading pelvic cellulitis, peritonitis, and hæmatocele—uterine dysmenorrhœa, and that arising from general disease.

The underlying ideas in the book seem to be that in the majority of cases the trouble originates in mental rather than physical causes; that repressed sexual instincts, disappointed affection, uncongenial surroundings, and worry, are the early factors in producing the pathological conditions upon which it finally depends. The question of "spaying," as might be expected, is fully discussed, and finds in him by no means a lukewarm advocate. He opposes the vaginal and urges the abdominal incision. For certain cases of ovarian neuralgia he also recommends clitoridectomy, though when we find him concluding by the remark that the subjects of the operation are not afterwards "devoid of proper sexual feelings," we are tempted to ask, as so many before us, "*Cui bono?*"

The author's chapter on Uterine Dysmenorrhœa gives us a full idea of his therapeutic resources; he is evidently a believer in uterine medication.

The various displacements are fully discussed. Ante-flexion is treated by dilatation with graduated sounds, "carefully making the turn and holding the uterus for a few minutes in the direction the reverse of its congenital curve." Ante-flexion pessaries he finds unsatisfactory; the stem pessary, preferably the stem and shield of Dr. Wynn Williams, has proved itself most successful in the author's hands, but he would never use it in a uterus tender or painful on the passage of the sound. Dr. Marion Sims's operation is also recommended. Retro-flexion, which causes "the most persistent dysmenorrhœa," the author often traces to too prolonged confinement "in the supine position after parturition." "It is dangerous to attack a case of retro-flexion by attempts at immediate reposition." Leeching, the use of glycerin plugs at night, perchloride of mercury internally, form the author's preliminary treatment; then, if there be no adhesions, the organ may be gently replaced every other day. As to pessaries, he favours the "simple Hodge pessary," or one "having its posterior aspect more bent upwards, its anterior more bent downwards." The author learned, after using this for some time, that Dr. Albert Smith, of Philadelphia, used a similar one, and he hints, by no means obscurely, that its real name should be the "Smith-Smith-Hodge," or the "Smith-Hodge-Smith" pessary.

Cervical stenosis is considered as a very rare factor in dysmenorrhœa, "except when associated with a flexion." When it exists, however, division followed by dilatation is the author's rule, rather than "tenting."

Spasmodic dysmenorrhœa, which commences before, and is relieved by, the menstrual flow, is diagnosed by passing a sound, which will produce severe spasmodic pain on reaching the inner os; for its relief hot sitz-baths and rapid dilatation are recommended. The chapter on Hysteria will add but little to our knowledge; for its cause the author "looks back of the uterus, back of the ovaries," to perversion of nutrition, and nervous overstrain.

Fibroids, fibro-polypi, fibro-cyst, areolar hyperplasia are considered as causes. The last condition is to be treated by local depletion and caustic potassa, applied to create an issue in the mucous membrane "until all the hardness has been removed," ergot being kept up meanwhile. In cancer of the cervix, where entire removal is not indicated, his own experience leads him to believe Chian turpentine "worthy of some more careful experiments" before it is consigned to the old property room with cundurango and its predecessors.

In membranous dysmenorrhœa we are advised to dilate the cervix with large sounds, cauterize freely the cavity of the uterus with solid nitrate of silver, nitric acid, strong carbolic acid, or carbolic acid with iodine. Should these means fail, "it may be advisable to pass a red-hot sound, or even a stick of potassa caustica;" and even after a cure "such cases are very liable to relapse."

The general diseases alluded to as causes of dysmenorrhœa are mentioned somewhat inelegantly as "rheumatism," "liver," "constipation," "spanæmia." Our author tells us that while the body of the uterus may be free from rheumatism, the cervix, "consisting as it does of contractile tissue interwoven with connective tissue," may suffer from "rheumatic infiltration." Constipation causes dysmenorrhœa "mechanically and constitu-

tionally," the mass of impacted feces in the rectum "presses on the uterus, forcing the cervix upward and forward. The author's remedies for the relief of this condition consist in going to the closet at a regular hour—he does not say which is the best hour—or a glass of cold water on rising, or saline laxatives. A short but interesting chapter on vicarious menstruation closes the book, which is in many respects to be commended, though the reader will hardly be expected to agree with the author in all points. E. W. W.

ART. XXXIX.—*The Treatment of Variocele by Excision of Redundant Scrotum.* By M. H. HENRY, M.A., M.D., late Surgeon-in-Chief to the State Emigrants' Hospital, Ward's Island, New York, etc. 8vo. pp. 24. New York: J. H. Vail & Co., 1881.

THE author of this monograph practises and recommends, for the relief of varicocele, the plan originally proposed by Sir Astley Cooper, namely, the removal of a section of the anterior wall of the scrotum, corresponding to the semilunar patch removed from the eyelid for ectropium. His belief is, that, by the contraction of the scrotum, the relaxation of the walls of the bloodvessels is counteracted, and that permanent cures result from this method. But recently he has presented the argument for it—an almost literal reproduction of the little book we are noticing—before the Philadelphia Academy of Surgery, with the effect of inducing some of the best known surgeons of this city to employ it.

As has been remarked, the idea of removing a portion of the scrotum for the cure of varicocele is not at all novel; and the only original contribution of the author to this method is the invention of a pair of curved forceps which apply themselves nicely to the scrotum, very much as Ricord's forceps for circumcision are fitted to the prepuce. This, however, is a valuable contribution to the surgical armamentarium; and, as the method recommends itself to the judgment on theoretical grounds, and there is no reason to doubt that it has proved as successful in the hands of the author as he claims it to have been, it seems to deserve an extended trial. In the author's hands, nine out of fourteen cases secured union by the first intention, and "made perfect recoveries within a week." That certainly sounds better than the results when the veins are ligated. The operation is simple in the extreme, and the curved forceps of the author seem to deserve a wider employment than they have had in the ten years since he first described and recommended them.

So much for the object of this monograph. Of its literary merits there is little to be said. The author's statements in regard to the method of Mr. Henry Lee (on page 13), we imagine would amuse the latter surgeon. Of his fourteen "conclusions," most might better have been marked "opinions," since they have no basis in the remarks which precede them. Finally, it strikes us as in bad taste to have the last three pages of the book occupied with quotations of admiring notices of works "by the same author." C. W. D.

ART. XL.—*The Wilderness Cure.* By MARC COOK. Crown 8vo. pp. 153. New York: Wm. Wood & Co., 1881.

A GREAT deal of attention has been given lately to the St. Regis region of the Adirondacks as a health resort for phthisical patients, dating from the publication of a paper on the curative properties of this climate by Dr. Alfred L. Loomis in the *Medical Record* in 1879. In *Harper's Magazine* for May of this year, the author of "The Wilderness Cure," a patient in an advanced stage of phthisis, narrates his experience in his search for health in this region, and where he appeared to have so much improved that he considered himself cured. His present book, he states in his preface, is in answer to innumerable inquiries as to details, and is consequently addressed to invalids intending to camp in the wilderness, and contains very full information on every point connected with the subject.

Although the author appeared to have greatly improved during his camp life, and to have materially retarded the progress of his disease, we have learned that since the publication of his book he has fallen a victim to the disease from which "The Wilderness Cure" had announced his recovery. R. M. S.

ART. XLI.—*The Principles of Myodynamics.* By JARVIS WIGHT, M.D., Professor of Surgery, and Lecturer on Physical Science at the Long Island College Hospital. Small 8vo. pp. 162. New York: Bermingham & Co., 1881.

THE work opens with the explanatory statement that "myodynamics treats of the forces of muscles and their effects." The author then proceeds to show that the mechanical principles of the lever, the inclined plane, the wheel and axle, and the parallelogram of forces are made use of in myodynamics. In the latter part of the book he further proceeds to apply the facts and principles demonstrated in the preliminary portion, to the various joints, thereby endeavouring to explain how the various muscles act so as to render the articulations stable or unstable, and the reasons why dislocations take place more readily in certain joint-positions than in others. As the major part of this treatise consists of a series of propositions, expressed in the most succinct manner, with the minimum of explanatory text, necessitating numerous illustrations to render the subject matter intelligible, it is clearly impossible, unless the review amounted to many more pages than the book itself, to give our readers such an analytical and critical review of the book as will enable them to judge for themselves as to the correctness of the criticisms which we may pass upon it. It is also impossible to select portions for analysis, since each, for accurate comprehension, is more or less dependent upon those preceding it.

After a most careful study of the book, we feel reluctantly compelled to limit our commendation to its "being a step in the right direction." The subject is made more abstruse by want of clearness and fulness in the explanatory text. The author aims at the highest science, yet has some of his cuts so carelessly executed that the letters in the text referring to essential

points are not to be found on the diagrams. In his desire to apply theory, facts are strained too far or quietly ignored when likely to prove obstinate. The applied part of the treatise is full of grave anatomical errors. If Dr. Wight be correct, instructors hitherto have taught facts which were not facts, and annually sent out hundreds of young men with their minds filled with anatomical errors. In justification of our criticism we will merely give a few extracts. Thus the biceps brachii is said to be a *pronator*, which is an absolute mechanical impossibility; as our author correctly states in another place, it is a *supinator* of the forearm. Again, "the anterior crucial ligament runs from the inner and front side of the spine of the tibia upward, backward, and outward, to the inner and back part of the external femoral condyle, *and limits the in-rotation of the leg, and prevents displacement of the tibia backwards.*" This is an absurdity, since a ligament can only check a given movement when that *motion tends to separate its origin and insertion*, in other words, makes its fibres *tense;* while a displacement of the tibia *backward* would approach the origin and insertion of this ligament and *relax* it. In the same way the posterior crural is said to prevent *anterior* displacement of the tibia, while in reality it prevents *backward* luxation of the tibia. This is a fact easily proven by means of actual knee-joints.

C. B. N.

ART. XLII.—*Medical Societies: their Organization and the Nature of their Work.* By J. COLLINS WARREN, M.D., Fellow of the Massachusetts Medical Society, Honorary Fellow of the Philadelphia Academy of Surgery, etc. An address delivered at the Centennial Meeting of the Massachusetts Medical Society, June 8, 1881. 8vo. pp. 68. Cambridge, 1881.

THIS is a well-considered and ably prepared account of the organization and methods of medical societies, associations, etc. The common object of all being to protect the people against medical impostors and impositions of every sort, to maintain the public health, and incidentally to augment and improve medical education and increase medical knowledge, and thus serve the interests common to all honourable and competent members of the profession, a general review of the many plans which have been devised and pursued, at home and abroad, to attain the ends proposed, is very interesting and valuable. By comparing the different modes of different societies and their results, it is possible that alterations or corrections may be suggested and made in the organization of some that will be manifestly advantageous to their efficiency. Dr. Warren's work affords an easy means for each society to compare its own methods of proceeding with those of other societies, and is likely to invite inquiry into and study of medical society organization. For this labour, Dr. Warren is entitled to the approbation and thanks of the profession generally.

W. S. W. R.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

On Cortical Lesions of the Brain.

M. Coutz has recently presented to the *Académie des Sciences* and to the *Société de Biologie* several notes on the excitability of the brain and on the theory of cerebral localization, and has lately collected and extended these notes in a memoir on this subject published in the *Archives de Physiologie*, 1881, p. 488. The seventy-six experiments made in the Laboratory of the Museum of Rio Janeiro have given him exceptional opportunities for studying the results of cortical lesion and excitation.

M. Coutz is a determined opponent of the theory of localization. He holds that neither in monkeys nor in dogs is there any relation between the seat of the lesion and the symptoms observed. As, for instance, after lesion of the zone of Rolando, disturbances of sensibility were observed, although in general this region is regarded as purely motor in function. Likewise, after lesion of the occipital lobes, to which sensory functions are usually attributed, disturbances in co-ordination of movement and loss of motor power have been observed. In all cases where there has been a cortical lesion of moderate extent, the normal reflex movements are diminished on the opposite side. As, for example, the eyelids are not closed when the hand is passed rapidly in front of the eyes. The character of the convulsions is also extremely variable.

All these facts are very difficult to observe and to analyze, and this alone would explain the disagreements of many observers. The phenomena of sensibility are above all inconstant in their appearance, difficult to produce, and very difficult to analyze correctly. The functional alterations of the senses of taste, hearing, and smelling, which Ferrier and Munk have found after lesion of the sphenoidal or occipital convolutions, have not been observed by M. Coutz, who refuses to acknowledge any constant relation between their appearance and the seat of the lesion. Disturbances of vision and of the tactile sense, on the other hand, nearly always follow lesions of the fronto-parietal regions.

The general conclusion to which M. Coutz arrives is that the cortical regions of the brain so act on reflexes as to diminish or at least cause them to be less regular on the opposite side. The cortical apparatus may be regarded as bearing the same relationship to the medullo-spinal apparatus as the peripheral spinal system, and to the extent in which reflexes are possible, as in curare and chloral poisoning, excitation of the periphery of the brain produces movements which

seem to confirm the analogy between reflex movements and those due to the cortical apparatus.

It is, then, according to the author, not necessary to discard the old views as to the inexcitability of the gray substance, while the theory of localization in the brain still remains to be proven. It has never yet been demonstrated, as the adoption of this theory requires, that there is a constant and invariable relation between the seat of the lesion and the character of the trouble produced. On this point, M. Coutz is completely in accord with M. Brown-Séquard, who believes that every lesion of the brain produces remote disturbances whose character depends upon the extent, and in no respect on the location, of the lesion, by acting by inhibition or excitation upon remote parts of the nervous system.

The differences of opinion between the most eminent physiologists teach us how much is still to be learned before we can speak with any degree of precision of the functions of cortical convolutions.—*Revue Scientifique*, Oct. 1, 1881.

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Localization of Functions in the Human Cortex Cerebri.

A contribution on this subject was read by Dr. EXNER before the Vienna Medical Society, on May 13 (*Wien. Med. Woch.*, 1881, No. 21). From several thousand cases in medical literature, Exner had collected 168 of pure lesion of the cortex cerebri, in which there were good histories of the patients and of the *post-mortem* examinations. According to the necropsies, the seat of the disease was marked on plaster casts, with colors chosen to denote the morbid symptoms observed; thus facial paralysis was marked yellow, red denoted disturbance in the motor power of the upper extremity, etc. This collection was then methodically prepared. The negative cases were first investigated on diagrams showing the four principal views of the cerebral hemisphere; all those parts of the cortex which in all cases of the collection appeared injured, and by the lesion of which the function which was to be examined had not suffered, were marked down. In this way the cerebral surface was covered with drawings of cerebral lesions; that spot only remaining white which bore reference to the function in question.

By this method of percentages, Exner divided the cerebral surface into 380 arbitrary squares; each square was numbered, and then, in order to discover the importance of any portion of the brain for any function, it was determined: 1, In how many cases this square had been the seat of a disease; 2, In how many cases the disease of this square was contemporary with the interruption of the function under investigation. The results of this method were represented graphically, so that every square received a tint which corresponded to the percentage found. If lesion of a square, the functional disturbance which was to be examined, had taken place in all cases, this square was marked black; if only in one case, the square remained white.

The third method was to inquire which parts of the cerebral surface were diseased when a certain function appeared to be disturbed. This method is most of all subject to deception.

Exner now examined what parts of the cerebral cortex were altogether susceptible of lesion without functional disturbance, and found that this was the case chiefly with the frontal and the temporal lobes. Yet in this a remarkable difference between the two hemispheres was discovered. Since the right hemisphere provides for the left half of the body, and *vice versâ*, it was naturally expected that the cortical regions belonging to the right hand, which is much more expert than the left, would be more extensive. And, in fact, it was found that altogether the left hemisphere is much more cultivated with regard to motion than the

right. In the left hemisphere the two central convolutions, and the whole of the parietal and occipital lobes, have proved to be localities which must not be injured if the lesion is to pass without disturbing motion and motor power, while in the right hemisphere the two central convolutions alone represent these exceptional places. Therefore, supposing a disease to be limited to one hemisphere, the probability of its course being latent may be represented in the right hemisphere by 3, and in the left by 2. The cortical field for the upper extremity in the right hemisphere is situated in the upper part of the two central convolutions and in the paracentral lobule, while that in the left hemisphere extends considerably further backwards. That part of the cortex which has in all cases produced the same symptom is marked by Exner as the absolute cortical field of the respective function, and that which only in certain cases produces the symptom he calls the relative cortical field. The cortical field for the upper extremity is very probably to be placed at a point in front of the fissure of Sylvius, in the lower part of which is to be sought the most intense portion of the cortical field, especially for the movements of the thumb. For the lower extremities, the portion of the cerebral cortex is smaller on the right hemisphere than on the left; and in the right hemisphere the main share falls to both central convolutions and to the paracentral lobule, while in the left hemisphere the corresponding cortical field extends as far backwards as the occipital lobe.

The relative cortical field of the lower extremity is just as large as that of the upper; although the absolute cortical field of the upper extremity is larger than that of the lower. The excess of extent which the cortical fields of the right hemisphere have over those of the left, is always found to be in a direction backwards, so that the cortical fields for the left extremities are much nearer the occipital lobe than those for the right, where they remain nearer the central convolutions. The cortical fields for the various functions varying in susceptibility of being affected, slight diseases will already have caused a disturbance in the region of the upper extremities before they reach the lower; there are slight lesions which cause complete paralysis of an upper extremity without greatly influencing the lower. This indicates that small lesions are not best adapted for the study of the localization of the functions of the cerebral cortex. With this corresponds the fact, that the absolute cortical fields are surrounded by a gray zone of the relative cortical fields, so that it appears probable that the power of any cortical portion which is of high importance for a certain function, will, as regards this function, decrease gradually in all directions. To prove this, Exner made an examination of one particular function, at the same time excluding from his percentage calculation all those lesions which encroached on the absolute cortical field; whereby it was found that even in this case there was a gradual decrease of power of the cortical field, from the absolute cortical field towards the circumference, in the direction of the limits of the cerebral convexity. Diseases seated in the absolute cortical field will always produce far more intense symptoms than those in the relative cortical field.

Exner then turns to the cortical field for the facial nerve. He says that, as a rule, all muscles which in ordinary life are innervated simultaneously, are represented together in the cerebral cortex, whether they be provided for by the same nerve or not. Since we are able to move the right extremity independently of the left, this is innervated by the left hemisphere only; yet we cannot innervate the external rectus of one side without also innervating the internal rectus of the other. These two muscles are provided with nerves by each of the hemispheres, therefore disease of both hemispheres will cause deviation of both eyes to one side. Our voluntary movements, as regards looking, do not intend a turning of both eyes to the right, but only purpose to catch sight of objects on our right

side; and therefore we turn the head together with the eye; and hence the muscles of the neck, together with those that turn with the eye to the right, are represented together in the corresponding part of the brain. Deviation of both eyes and of the head to one side is very frequent in lesions of one hemisphere. If it were merely accidental that, when both eyes deviate, the head also deviates to the same side, the calculus of probability would show that no fewer than 20,000 cases would be required to produce that number of deviations of the eye and the head together, which Exner has found in his collection of 168 cases.

As regards speech, Exner remarks that there is no absolute cortical field. The seat of word-deafness must be placed in the second temporal convolution. Amnestic and atactic aphasia is confined chiefly to the second frontal convolution. The centre of speech is situated in the left hemisphere only, that one which is the more cultivated in regard to motion. It is but natural that the movements of articulation should be directed by one hemisphere only. Speech would be considerably disturbed if, for instance, in pronouncing the letter "j" (English "y" in "you") one corner of the mouth should be raised one-tenth of a second later than the other.

Exner then speaks of the cortical fields for the sense of sight, and of those for the tactile sensations, and finally remarks that he considers it of puerile conception, to imagine a single small portion of the body to have no other destination than to serve, as it were, as a handle for the soul in order to innervate a certain group of muscles. It is plain that the conditions at the cerebral cortex are much more complicated, and the corresponding cerebral portion where fibres enter certainly serves for a good many other purposes besides innervation.—*London Med. Record*, Oct. 15, 1881.

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A Centre for Colour-Vision.

The physiology of colour-vision has hitherto been studied mainly in reference to the peripheral organ. The functions of the organs of sense have necessarily to be ascertained with exactness before the central relations of those functions can be investigated. The subject of colour-vision is one in which experimental inquiry can give little help, and we have to rely on the slower progress of clinical and pathological investigation. It is rare to meet with clinical evidence at once so clear and conclusive in its physiological significance as that which has been lately published by Samelsohn, of Cologne, on the important subject of the cerebral perception of colours.

The phenomena of congenital colour-blindness suggest that the cerebral centre for colour-vision is distinct from that for the perception of light and visual space impressions, since the perception of colour may be absent when the two latter functions are unimpaired. Unless this explanation is adopted, we are driven to the assumption that the functions of the same centre are so dissociated that the absence of one does not interfere with the perfect development of the others—an hypothesis which presents perhaps the greater difficulties. If a separate centre for colour-vision exists it must be sought, according to the facts already ascertained by experiment, in the occipital lobe. The localization of this centre cannot be effected by experiment, but must be ascertained by pathological investigation, especially by the study of colour-vision, in cases of hemiopia which depend on a lesion, not of the optic tracts, but of one cerebral hemisphere. Are there cases in which such hemiopia is confined to colour-vision? Such cases would, it is evident, afford conclusive proof of the existence of a separate centre for colour-vision.

One such case has been met with by Samelsohn. Uncompleted as it unfortu-

nately is by anatomical proof of the region affected, it is yet of undeniable importance. A man aged sixty-three complained of affection of sight, which followed an apoplectic seizure. Right-sided hemiplegia was present at first, but nine months afterwards had lessened to a trifling weakness in the arm and leg, without loss of sensibility. Examination of the eyes showed that the ophthalmoscopic appearances were normal, and the acuity of vision unimpaired, excepting trifling presbyopia; slight weakness of the right superior rectus existed, with corresponding diplopia above the horizontal plane. Since he complained of imperfect sight, even when the right eye was closed, the fields of vision were examined. On testing with a white object no defect could be discovered, even with a test object of very small size. When, however, coloured tests were substituted, there was found to be a typical left-sided hemiopia for all colours; the loss began exactly at the vertical middle line. In the right half of each field every colour was seen, even in the smallest area, well up to the periphery; in the left half no colour could be recognized, even in a large area, each appearing to be a dull gray. The same result was obtained on testing in the dark with lights tinted by passing through coloured glasses. Under treatment the paralysis of the superior rectus passed away; the paresis of the limbs and the affection of sight remained exactly the same. Four years later the patient died, after a fresh attack of apoplexy, but unfortunately no post-mortem examination could be secured.

Although no case equally clear has hitherto been recorded, facts pointing in the same direction have been observed by Treitel. The clinical evidence must thus be considered conclusive that there exists in the cerebral hemisphere a centre for colour-vision so independent of that for white light that it is capable of separate damage from acute lesion.—*Lancet*, Nov. 26, 1881.

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Transplantation of the Medulla of Bone.

Prof. Bruns, of Tubingen, reports in the *Archiv für Klin. Chir.*, Band xxvi. Heft 3, the results of some experiments he has lately made on animals, with the object of determining whether portions of transplanted bone-marrow can give rise to the formation of deposits of true osseous structure. An osteogenetic function of marrow, though indicated by the existence of an internal as well as of an external mass of callus after fracture, has been denied by many pathologists, and especially by Lebert, who held that the internal callus is only a displaced portion of the callus formed by the periosteum. It has been held also by Maas and many others, that the marrow and medullary membrane can only absorb and never form bone. The only cases in which any bone-producing action on the part of marrow can be proved in the human subject, are pathological instances of intramedullary deposition of bone without fracture, and without any coexistent formations of bone externally. Werner, by administering phosphorus with food, succeeded, even in full-grown animals, in bringing about almost complete ossification of the medullary cavity of long bones; and similar results have been attained by Busch through injections of mercury in small quantity into the arteria nutritia. That this internal formation of new osseous tissue in a long bone may be due to the action of specific stimuli, as well as to that of irritating agents introduced from without, may be proved by specimens of so-called osteosclerosis, in which disease the whole of the medullary cavity is often occupied by a very hard ivory-like substance. In order to decide whether or not this proved osteogenetic action of marrow be of a strictly pathological character, and analogous to the rarely observed ossification of muscular and testicular structures, Dr. Bruns instituted an extensive series of experiments. It was proposed to settle this

question in the same way that the bone-forming capability of periosteum had been proved, namely, by transplantation. Experiments of this kind had, however, been previously made, first by Ollier and Maas, who obtained but negative results, next by Goujon, and afterwards by Backow, both of whom seem to have had some success. In Bruns's first series of experiments, performed in sixty instances on rabbits and fowls, and in six instances on young dogs, and in which the marrow was always transferred from one animal to another, there was invariably failure. In a second series of experiments on nineteen animals, in each of which experiments the transplantation was made on one and the same animal, deposits of true bone were found in twelve instances. Professor Bruns states that the animals that are best suited for experiments of this kind are young dogs. A portion of the shaft of the femur or tibia is resected, and the marrow contained in this resected fragment is removed in an unbroken cylinder. Portions of this cylinder are then inserted into fresh wounds on the breast or back of the same animal, either into the subcutaneous fat or in a superficial part of the muscular layer. The wounds are then carefully closed by means of sutures. The following changes, it is stated, take place in each instance of successful transplantation. A diffuse swelling is at once formed, which speedily begins to diminish, and is replaced about the fourteenth day by a movable nodule, in which bony tissue already exists in scattered foci. By the twenty-fourth day, these foci have usually amalgamated into a single piece of bone. Microscopical examination proves that the nodule, in its early stage, is composed of osteoid tissue, cartilage, and newly formed osseous tissue, and that the fully developed hard mass consists of true bone.

These experiments, Professor Bruns asserts, prove that bone-marrow, completely separated from its connection with bone, and transplanted under the skin of the same animal, at a remote part of the body, may give rise to the formation of bone and cartilage. The swelling at the seat of transplantation ossifies in part directly, and in part by the conversion of cartilage and osteoid tissue into hard bone. The same process takes place in the formation of both the inner and the outer callus after fracture; and it may be assumed that bone is formed from the medulla in a way similar to that in which it is formed from the inner surface of the periosteum. It is held by Professor Bruns that in each instance the osteogenetic function is due to the same elements, namely, to osteo-blasts, which exist in the inner periosteal layer, and are scattered amongst the elements of bone-marrow, particularly in young animals. Professor Waldeyer, of Strasburg, who has examined these specimens, agrees in the view of the part played by the osteoblasts in the ossification of marrow, and is not disposed to admit any participation in this process of leucocytes of the marrow, wandering leucocytes from the blood, metamorphosed fat-cells, or newly formed spindle-shaped connective tissue-cells. *London Medical Record*, Oct. 15, 1881.

Dr. TH. KÖLLIKER (*Cbl. f. Chirurgie*, 1881, No. 37), attracted by the report of Bruns on the transplantation of marrow, has made some experiments in this direction. He employed half-grown rabbits for his experiments, all the transplantations being made upon one and the same animal. Unlike Bruns, Kölliker transferred marrow, not to the skin, but to the anterior chamber of the eye and to the abdominal cavity. Transplantation of marrow to the anterior chamber of the eye was accomplished in the following manner: The tibia of another animal was trephined, a cylinder of marrow removed, and this was thrust into the anterior chamber by means of a small instrument similar to the Dittel's *porte-remède*. For transplantation into the abdominal cavity exarticulation of the knee-joint was practised, and the entire cylinder of marrow from the diaphysis of the tibia was placed in the abdominal cavity. After several failures—

partly on account of defective procedure, partly on account of too brief time of observation—Kölliker succeeded in producing both cartilage- and bone-formation from the transplanted portions of marrow. Kölliker can therefore confirm Bruns's assertion that marrow entirely removed from its connection with bone, and, in the same animal, transplanted to a distant part of the body under the skin, forms cartilage and bone, adding thereto the anterior chamber of the eye and the abdomen.—*Philadelphia Medical Times*, Nov. 19, 1881.

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Polyuria.

MM. R. Moutard-Martin and Charles Richet have contributed several facts on the artificial production of polyuria, relating particularly to the substances which, when introduced into the circulation, increase the elimination of water and of urea by the kidneys.

Their method of procedure is very simple: a canula is inserted in each ureter and the two connected by a T tube, from which the urine is allowed to fall, drop by drop. In a dog of medium size, about three drops will fall in each minute; when the number of drops reaches five or six in a minute, polyuria is evidently present. It is necessary to wait about an hour after the operation for the abdominal traumatism to pass off, when the secretion takes place in a perfectly regular manner.

Pure water, injected into the blood, instead of accelerating the secretion, retards it, and even in small quantities may cause almost an entire suspension of renal secretion. As, for example, in a dog of ten kilogrammes weight, 300 grammes of warm distilled water arrested the secretion, and an injection into a vein of even 50 grammes served to retard it. On the other hand, saccharine solutions enormously increased the elimination of urine. Even an injection of 10 grammes of sugar produced immediately both polyuria and glycosuria; the urine became limpid, transparent, and very light coloured; it contained very large quantities of sugar, but neither albumen nor blood, although after the injection of large quantities of water, both the latter are to be found. If the quantity of sugar injected is considerable, the polyuria becomes very strongly marked, the elimination of water reaching as high as forty times the normal amount.

Large doses of sugar also increased the amount of the other secretions, particularly that of the intestines, in which large quantities of sugar were also found. Water alone, on the other hand, in no instance increased the intestinal activity, whatever the quantity injected. These facts can evidently be attributed to the high osmosic properties of sugar. All the sugars have the same action; dextrine, however, passes with greater difficulty, but it is capable of passing off through the kidneys, and when injected into the circulation, causes polyuria.

All the substances which can pass into the urine, when injected into the blood, can cause polyuria, as instanced by chloride of sodium, urea, glycerine, and soluble phosphates. These substances cause diuresis, and the diuresis coincides with the elimination. When polyuria is due to alteration in the composition of the blood, it may be attributed to the presence in the blood of substances which the kidneys should eliminate, an elimination which cannot take place without an accompanying removal of fluid. The kidney then should be regarded as the regulator of the concentration of the blood, and polyuria as the result of a too great concentration of a dialysable substance in the blood, the different conditions of pressure and innervation being excepted.—*Revue Scientifique*, Oct. 1, 1881.

MATERIA MEDICA AND THERAPEUTICS.

A New Method of Administering Anæsthetics.

At the meeting of the *Académie des Sciences de Paris*, on November 14th, M. PAUL BERT presented a memoir on the safe proportions of anæsthetic agents when mixed with air, and on a new process of chloroformization.

When one adds to air, in increasing proportions, vapours or gases possessing anæsthetic properties, and causes an animal to breathe these successive mixtures, there arrives a moment when anæsthesia appears. If the proportion of the anæsthetic is then increased, the animal dies. The author designates by the term *zone maniable*, the interval between the anæsthetic and fatal dose.

In carefully determining the boundaries of this *zone maniable* with different anæsthetics (chloroform, ether, amylene, bromide, and chloride of ethylene), and on different animals (dogs, mice, sparrows), the author obtained the singular result that the fatal dose is precisely double that necessary to produce anæsthesia.

This *zone maniable* is singularly narrow, even the addition of a few drops more of the liquid can cause an active mixture to become fatal. This is especially true for chloroform. 8 grammes volatilized in 100 litres of air are not sufficient to anæsthetize a dog, while 20 grammes are fatal, a difference of 12 grammes. With ether there is considerably less danger, while the general proportions hold, the difference here between an active and mortal dose being 40 grammes. This is incontestably the cause of the relative innocuity of ether in surgical practice.

Nitrous oxide has a *zone maniable* which is more extended than that of either the carbides or chloro-carbides of hydrogen. For the latter it is in the proportion of 1 to 2; for the former it is as 1 to 3.

The author thinks that these new researches on the *zone maniable* should lead surgeons to attempt in their practice the applications of the same method. The instrument required is very simple, a zinc reservoir holding 200 to 300 litres would answer.—*Revue Scientifique*, Nov. 26, 1881.

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The Use of Quebracho in Dyspnœa.

Dr. ANDREW H. SMITH, chairman of the Committee on Restoratives of the Therapeutical Society of New York, has submitted on behalf of the committee a report, founded on clinical data, on the use of quebracho in dyspnœa, which is published in the *New York Med. Journal and Obstet. Review* for September, 1881. Of the thirty-two cases covered by the report, eleven were of spasmodic asthma, with or without emphysema and bronchitis. Of these, in nine cases the dyspnœa was notably relieved. In two cases of asthma associated with bronchitis no benefit resulted. One patient with emphysema and bronchitis without asthma was relieved. One with bronchitis with obesity was not relieved. Two with mitral insufficiency were not relieved. One with mitral stenosis was not relieved. One with hypertrophy with dilatation was not relieved. In two cases of cardiac disease (form not stated) the dyspnœa was relieved. In one case of fatty heart there was slight relief. Two patients with dyspnœa depending upon Bright's disease, in one of whom pulmonary œdema was noted, were relieved. In one case of aortic aneurism the dyspnœa was relieved till near the close. In one case of tonsillitis the dyspnœa, partly nervous, was relieved. In one case of cancer of the lung dyspnœa was relieved. In two cases of pneumonia it was relieved. One patient with hysterical dyspnœa was relieved. In one case of catarrhal phthisis, second stage, the dyspnœa was relieved. In one case of catarrhal phthisis, third stage, it was not relieved. In one case of intermittent fever

with old pleurisy, the patient being an opium-eater, the dyspnœa was increased. Thus, of the thirty-two cases of different diseases in which dyspnœa formed a prominent feature, this symptom was relieved to a greater or less extent in twenty-one; not relieved in ten; aggravated in one. In some instances the treatment was not pushed far enough to give a decisive result. It is possible that the nausea observed in some cases might have been avoided by the use of smaller doses, and perhaps a favourable result obtained. The fact that dyspnœa depending upon such a variety of causes may be relieved by quebracho points, says the writer, to the respiratory centre as the seat of its action. Apparently it blunts the sense of want of air, and thus mitigates the suffering from a deficient supply. But this action is not necessarily only palliative. Exaggerated respiratory efforts are often in themselves an evil, not only on account of the muscular effort expended, but from the aspiration of blood into the thoracic viscera, which results especially when the dyspnœa is caused by narrowing of the air-passages rather than by solidification or compression of the lung. Hence in many cases an agent which will moderate the violence of the respiratory movements will not only lessen the distress of the sufferer, but will increase the chances of his recovery. That quebracho will often very promptly fulfil this indication there seems to be no room to doubt, while as yet there is no evidence that it is liable to produce unfavourable after-effects. The extremely disagreeable taste of the medicine and its tendency to produce nausea are, however, serious drawbacks to its use by the mouth. As yet, we have no record of its employment by the rectum. If the active principle is isolated, so that it can be used hypodermically, a great advantage will have been obtained.

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Action of Duboisia on the Circulation.

In a memoir on this subject in the current number of the *Journal of Anatomy and Physiology*, Dr. GIBSON gives the result of some researches he has recently made. The conclusions to which he has arrived are: 1. That duboisa in quantities not exceeding 0.005 gramme raises the arterial blood pressure without materially affecting the pulse rate. 2. In quantities not exceeding 0.05 gramme it diminishes the blood pressure and lessens the pulse rate. 3. In quantities of 0.05 gramme and upwards it causes death, with the heart in a state of diastole. 4. Upon the heart itself duboisia has but little action, except in very large doses—*i. e.*, doses of more than 0.05 gramme—and it then causes arrest of the heart in diastole. 5. Duboisia stimulates the central inhibitory mechanism. 6. The alkaloid paralyzes the peripheral inhibitory apparatus. 7. Duboisia stimulates the central vaso-motor apparatus, and causes contraction of the arterioles in small doses; in large doses it lowers the activity of the central vaso-motor mechanism and dilates the arterioles. 8. Duboisia has no influence over the sympathetic nerve.—*Lancet*, Nov. 5, 1881.

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The Hypodermic Injection of Mercurialized Peptone.

M. MARTINEAU, in spite of the ill success which has so often attended the administration of hypodermic injections of mercury in union with albumin, has yet been led to make a further trial of them. He calls the injections which he uses, *mercuric peptone;* they consist of a salt formed by the union of one gram of bichloride of mercury with one grain of chemically pure peptone. This salt is dissolved in so much water as will make each cubic centimetre of the resulting solution contain four, six, eight, or ten milligrams of the corosive sublimate, according to the quantity of mercury which it is intended to introduce into the system. To accelerate the solution, and to prevent its too rapid action on the

surrounding tissues, a sufficient quantity of sodium chloride, or, better still, of ammonium chloride, should be added. Seven hundred and sixteen hypodermic injections of this solution were made in the course of two months in patients suffering from secondary syphilis in various degrees of intensity. Apart from the efficacy of the remedy, M. Martineau recommends it on account of the exactitude with which the dose may be estimated, as well as from rapid and total absorption of mercurial preparations which are so frequently difficult to give by the mouth. No accident has as yet happened from its use, in the direction of abscesses, scars, or salivation. In a few cases a slight swelling has occurred at the point of puncture, but no inflammation has resulted.—*Practitioner*, Nov. 1881, from *Le Progrès Médical*, July 2, 1881.

Since the publication of the above note, M. Martineau has continued his observations, with the result of confirming in 3087 injections the results drawn from those already reported. Analysis of the urine showed the presence of mercury in the urine after the injection of five milligrams. For internal use he gives the following formula: Ammoniacal mercurialized peptone, 1 grm.; glycerine, 50 grm.; water, 200. Dose, about 5 myr.—*Bull. Gén. de Therapeutique*, Oct. 30, 1881.

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Indications for the Administration of Digitalis.

Digitalis may be administered with advantage in acute febrile diseases, in hæmoptysis and other hemorrhages, and in cardiac affections. It is not very safe as an antipyretic, as there is always danger of sudden collapse. It is difficult, says Professor LEYDEN (*Deutsch. Med. Zeitsch.*, No. 23, 1881) to lay down definite rules for its administration in cardiac affections, as every case must be judged on its own merits. It is specially indicated in mitral and aortic disease when there is diminished arterial tension, with dyspnœa and scanty secretion of urine. In these cases it is best given in small doses, of from one-quarter to one-fifth of a gramme daily. Should these doses fail, it is quite an open question whether it is advisable to give more. In hypertrophy and dilatation of the left ventricle, with lung-mischief, digitalis is a very uncertain remedy. It is a feeble diuretic, and only succeeds when there is a feebly acting left ventricle. Digitalis is best given in the form of tincture or infusion. Probably the best substitute for digitalis is squill. It may be given in combination, or, better still, digitalis may be given first, with squill to follow.—*London Med. Record*, Oct. 15, 1881.

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The Therapeutic Action of Chinolin.

R. v. JACKSCH has made a number of observations on the action of chinolin in increasing the spontaneous morning remission of temperature in typhoid fever, intermittent fever, tuberculosis, etc., and found that, when the chinolin was withheld, the morning remission was absent, or at least less marked than when the chinolin was given in the afternoon and evening before the observation. By administering the drug in the morning, he found that chinolin was able also to reduce the evening rise in temperature, but to a less degree than quinine. Chinolin does not exert any favourable influence on the duration of the disease, and frequently causes violent vomiting, so that in some cases its further administration was impossible. In two cases of intermittent fever, chinolin produced a cure after two days' use, while in a third case it seemed simply to postpone the attack and to diminish the cold stage, but produced a cure after a few days' use. The author uses doses of from fifteen to forty grains with citric acid and syrup.

DONATH has also made similar observations with analogous results on rabbits and fever cases, using two-tenths of a gramme doses hypodermically.—*Centralblatt f. d. Med. Wissen.*, No. 45, 1881.

Naphthol in Skin Diseases.

Prof. KAPOSI, of Vienna, has recently experimented (*Wien. Med. Wochenschr.*, No. 22, 1881) with naphthol in the treatment of skin-diseases. The naphthol used is the β-naphthol of chemists, and was employed either in solution in diluted alcohol, or in ointments. This substance has a therapeutic value in skin-affections similar to that of tar, of which it is a product, but has the great advantage of being almost odourless and colourless when used in a thin layer; and it stains neither the skin nor the hair. An ointment of 10 to 15 per cent. was found efficacious in scabies; and, in the Vienna Hospital, the modified Wilkinson's ointment has been replaced by one for which the following formula has been given: ℞. Naphtholi 15; axung. 100; sapon. vir. 50; cret. alb. p. 10. The advantages claimed for this treatment are that the eczema provoked by the acarus is cured simultaneously with the destruction of the parasite. The simple naphthol ointment was found efficacious in psoriasis; and, as it does not stain the skin and hair, it is especially suitable for psoriasis of the scalp, face, and hands. In eczema, a two and a half per cent. solution in diluted alcohol was found useful in conditions in which tar would have been indicated, and its use in this disease requires similar caution. Professor Kaposi is continuing his experiments with this substance, which promises to be a useful addition to the means at our disposal in the treatment of diseases of the skin.—*British Med. Journ.*, Oct. 8, 1881.

Hydrobromic Acid.

MASSINI (*Correspondenzblatt für Schweizer Aerzte*, Sept. 1881) regards this drug as a valuable acquisition to our stock of remedies. While the indications for its exhibition are the same as those for the other preparations of bromine, such as bromide of potassium, monobromide of camphor, etc., it possesses the advantage over the latter of having a more pleasant taste and of being better borne by weak and sensitive stomachs. The remedy was administered to thirty-one individuals with the following results: in four cases—one of violent neuralgia and sleeplessness, associated with cardiac disease, one of insomnia in an insane person, and two of aggravated hypochondriasis—it was of no value; moderate relief was afforded in seven cases—hypochondria with palpitation of the heart, hysteria with the same complication, nervous hyperemesis, hysteria with insomnia, the same with congestions at the menopause, hysteria with intense vertigo, and anæmia in a youth suffering from violent headache upon the least exertion. The acid was productive of marked and sometimes lasting benefit in the remaining twenty cases, comprising examples of nervous palpitation of the heart, insomnia, cerebral congestion and dizziness, paroxysmal headache in an individual affected with multiple sclerosis, congestive toothache occurring during pregnancy, persistent hyperemesis, hysteria, and, finally, pollutions from onanism. The remedy is best given about fifteen minutes after meals, in doses of ten drops of the concentrated (twenty-five per cent.) solution, or twenty to thirty drops of the dilute (ten per cent.) solution, well diluted with sweetened water. No unpleasant after-effects were observed.—*Med. Record*, Nov. 12, 1881.

MEDICINE.

The Nature of Diphtheritic Contagium.

Prof. H. C. WOOD recently read before the Academy of Natural Sciences of Philadelphia an abstract of some researches made with Dr. Formad, at the suggestion of the National Board of Health, as to the nature of the contagium of

diphtheria, and, as the full account of the experiments will not appear until the publication of his memoir by the National Board, the authors ask that criticism be withheld until then. Their first experiments, made in 1880, by attempting to inoculate rabbits by inserting fragments of diphtheritic membrane under the skin, gave negative results, the animals dying from tuberculosis; insertion of the dipththeritic membrane, however, into the trachea frequently produced a severe tracheitis, attended by the formation of a false membrane identical in character with that formed in diphtheria. It was then next determined that other severe non-specific inflammations of the trachea were attended by the formation of pseudo-membrane, not differing from the membrane of diphtheria except that the micrococci were not so abundant; they therefore concluded that the production of false membrane is of itself no evidence of any specific action.

In examining cases dying from malignant diphtheria, the authors found that the blood in all instances was more or less full of micrococci, some free, others in zoogloea masses, others in the white corpuscles; they were also found in the internal organs, especially in the kidneys, where they formed numerous thrombi. Inoculations practised on animals with the material from these malignant cases were in all instances followed by a grayish exudation at the seat of inoculation, with much inflammation, and subsequently death. The blood also during life and after death contained micrococci similar to those found in the cases of diphtheria; they were also found in abundance in the internal organs. Studies made upon the blood in these experiments, and in the cases of malignant diphtheria, showed in both cases that the micrococci first attack the white corpuscles, in which they move with a vibrating motion. Under their influence the corpuscles lose their granular appearance, and finally become full of micrococci, which now are quiescent, and increase until the corpuscle bursts, and the contents escape as an irregular transparent mass full of micrococci, and form the so-called zoogloea masses. In the diphtheritic membrane the micrococci frequently exist in balls, which are merely leucocytes full of the plant. The bone-marrow of the animals was found full of leucocytes and cells containing micrococci.

The authors concluded that the disease produced in animals by inoculation was diphtheria from the facts that the symptoms and post-mortem lesion were identical, and that the disease retained its contagious character.

In their efforts to determine whether the micrococci were the cause of diphtheria, following the method of Letzerich, the authors found that when the urine of diphtheria patients containing micrococci was filtered, and the dried filter-paper inserted under the skin, malignant diphtheria was produced, and, further, cultivated micrococci up to the second generation are capable of producing diphtheria inoculation. They therefore conclude that the essential poison of malignant diphtheria is found in the micrococci, which must be either the poison itself or the carriers or producers of the poison.

From their culture experiments the authors conclude that the only detectable difference between the micrococci found in ordinary sore-throat and diphtheria is in their reproductive activity, the former ceasing their reproduction at the third transplantation, while the latter grew rapidly up to the tenth generation; they are therefore the same organisms in different states.

The difference, therefore, between a simple angina and a malignant diphtheria, in both of which micrococci are present, is simply dependent upon the reproductive activity of the plant, and the malignancy is in direct proportion to that activity. This identity of the organisms is further established by the fact that, when a membrane from a malignant case of diphtheria is dried, it loses in malignancy of contagiousness in proportion as its micrococci lose in activity, so that a virulent membrane may become inert, its micrococci not only looking like those of an ordinary angina, but behaving like them.

We will await with interest the complete account of the author's interesting researches and the results promised from the investigations of the conditions outside of the body which favour the production of active micrococci, and the effects of agents in killing these organs.—*Philadelphia Medical Times*, Oct. 22, 1881.

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Pilocarpine in Diphtheria.

Dr. Adolph Fasano, in a recent number of the *Giornale Internazionale delle Scienze Mediche*, offers some observations on the use of pilocarpine in diphtheria, a mode of treatment which has been said to be attended with the most favourable results. He quotes the reports of Dr. Guttman, who extols most highly the use of pilocarpine in this malady. Dr. Guttman administers it internally in solution in the form of hydrochlorate combined with pepsin, the dose varying according to the age of the patients. Dr. Fasano also quotes a case reported by Professor Cantani as having been treated successfully by pilocarpine alone. Professor Lepidi-Chioti, who has reported this case in all its particulars, describes two other cases of the same kind which were equally benefited. But it is stated that large doses may disturb the stomach and cause spasm and vomiting, and therefore it is necessary to be very careful in the mode of administering the drug. The anti-diphtheritic properties of pilocarpine are said to be due to the great salivation induced, by which means the detachment of the false membrane is much accelerated, and thus the course of the disease is shortened. Lepidi-Chioti also regards the sweating as a true depurative, eliminating a quantity of the virus circulating in the blood, in the same way as pyrogenic matters are expelled by the perspiration in fevers. The human skin is a true filter, and, as such, various products are eliminated by it from the system. The success of pilocarpine is therefore due, according to some authors, to the salivation detaching the false membrane, or, according to Lepidi-Chioti, to the copious perspiration. Dr. Fasano, in relating these views, adds his own testimony to the efficacy of pilocarpine in diphtheria, but proposes some questions as to the theoretical reasoning on which the treatment is founded; and he gives his opinion, in the first place, that the detachment of the false membrane, although an important element in the treatment, is by no means the only curative object to be attained. He asks, accordingly, to be informed as to the exact therapeutical value of the detachment of the false membrane, and whether it is certain that the diphtheritic virus, circulating in the blood and in many of the internal organs, is really eliminated with the sweat. Again, if it be admitted that it is eliminated, is it all eliminated? and has pilocarpine a local and general antiseptic action which enables it to destroy the products and the factors of the diphtheritic virus? If an explicit and experimental solution of these doubts should be afforded, then, Dr. Fasano thinks, it may be said that a great remedy has been discovered for diphtheria; and the easy administration of pilocarpine, its rapid action and its innocuous nature, are so many further recommendations for its use. In the mean time, he himself proposes to make further trials of the remedy, and recommends his colleagues to do the same, and if trustworthy results should confirm the observations of Lepidi-Chioti, Dr. Fasano, regarding the ultimate object, namely, the cure, will withdraw the doubts which he now entertains on the subject.—*Med. Times and Gazette*, Nov. 19, 1881.

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Bacillus of Enteric Fever.

In the *Arch. für Exper. Path. und Pharm.*, Band xii. p. 234, Professor Klebs published some preliminary observations on this point, and he now (*Arch. für Exper. Path. und Pharm.*, Band xiii. Heft 5, 6) gives a full account

of his observations and experiments. Professor EBERTH has, meanwhile, published (Virchow's *Archiv*, Band lxxxi. p. 58) views in many points confirmatory of those of Professor Klebs.

Professor Klebs' results may be summarized as follows:—

1. The bacillus typhosus occurs constantly in the intestinal infiltrations of enteric patients, as also in those anatomical alterations considered secondary—in the mesenteric glands, for example, the larynx, the lungs, the pia mater, the kidneys. Professor Klebs considers that, in some epidemics, the lungs are by inhalation primarily affected, or that at least the disease in them runs parallel with that in the intestine. In such cases, there is œdema with collapse of lung, mostly in the posterior part of the lower lobe, not dependent on meteorism, because he finds it present when meteorism is entirely absent. Professor Klebs delineates a case of this nature.

2. The bacillus typhosus forms at the height of its development long undivided threads containing spores; but, in its earlier stages, it appears as short rods containing terminally placed spores. The thread-form is found in close mycelia in the tissues, and also in more simple parallel or spiral arrangement in the interior of bloodvessels. The bacillus differs from the organisms of ordinary putrefaction frequently found in the intestinal contents, first in its greater fineness and its appearing as rods and threads; secondly, in the fact that it penetrates the tissues, which the coarser varieties never do.

3. Where the bacillus typhosus collects, the cells of the tissue degenerate and disappear. Sometimes, however, the cells develop rapidly, overcoming the bacillus, and then the bacillus may spread by means of the bloodvessels and so reach the kidneys, pia mater, heart, and lungs, although these last may be primarily affected.

4. Micrococci are developed only in isolated cases, and are simply complications of the bacillary development, being associated with the septic process.

5. From experiments in which he injected subcutaneously in rabbits fluids containing the bacillus typhosus, cultivated with most painstaking precautions, Professor Klebs considers himself justified in the conclusion "that the bacillus typhosus, under favourable conditions, develops in the mucous membrane of rabbits into the same thread-mycelium as can pervade the whole mass of a typhoid infiltration, and fill the bloodvessels in the human intestine. The histological changes in the two cases correspond, and still further strengthen the conclusion that this organism is the essential cause of the typhoid process."

With regard to the treatment of enteric fever, Professor Klebs' views are naturally based on the results above enunciated. If enteric fever really depend on the development and migration of an organism, the therapeutic indication is to check the growth of this organism. At the present time, treatment in enteric fever is mainly directed towards a reduction of the temperature. While admitting that repeated cold baths to a certain extent accomplish this, he has found them utterly fail in certain epidemics, and he points out that the interesting cases published by Strube and Fraentzel (*Zeitschr. für Klin. Med.*, Band ii. Heft 2) of severe enteric fever without high temperature, show an exclusive attention to the temperature to be unjustifiable. Antimycotics, when used in the disease, have been regarded as antifebrile; but Immerman, from his favourable results with salicylic acid, recommends thorough disinfection of those probably infected. The statistics of three epidemics given by Jahn show a lower mortality and shorter average duration of the disease in that treated by salicylic acid or salicylate of soda (ʒj to ʒiss daily) than in the other two. Salicylic acid seems to exert no effect on typhoid pneumonia, from which the fatal cases died; but the delirum disappears rapidly, pointing to an accumulation of the remedy in the

central nervous system. The fall in temperature is gradual, and at first it may even rise higher, but in that case there are marked remissions. As an antimycotic, Professor Klebs recommends benzoate of magnesia (ʒv daily), with inhalations of a five per cent. solution of benzoate of soda, with which he would combine cold compresses for the abdomen, and occasional cold baths.—*London Med. Record*, Oct. 15, 1881.

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Generation of Malaria in Flower-pots.

Prof. Tommasi-Crudeli pointed out recently in the *Practitioner* (Nov. 1881) that the production of malaria is not necessarily connected with the presence of marshes, ponds, etc., or with the putrefaction of organic substances; that the production of malaria ceases when the air can no longer act directly on the malarial soil, and that a very moderate degree of humidity is sufficient to produce malaria. To these points he now adds that the production of malaria is suspended when the summer is cool, and excessively warm weather may produce malaria in regions not otherwise malarial. Hence the keeping of numbers of plants in heated and imperfectly aërated rooms may cause malarial infection, even in regions where malaria is unknown. Several instances of this nature have been spoken of in the north of Europe. Prof. Eichwald of St. Petersburg communicated to Prof. Tommasi-Crudeli the following case:—

A Russian lady, who usually enjoyed good health, and who lived in a perfectly salubrious locality, was attacked by an intermittent fever of a true malarial character. The febrile attacks yielded easily to moderate doses of quinine, but a relapse invariably took place when the invalid returned to her ordinary habits of life. These alternations of easy cures and of obstinate relapses continued for many months, during which time Prof. von Eichwald was unable to discover the cause of this singular affection. One day he was struck by this circumstance: the cure of the attacks was maintained as long as the invalid remained in the bedroom, while the relapses took place when she left that room, even when she did not leave the house. Now this lady, when not suffering from fever, passed the greater part of her time in a well-heated drawing-room, containing a considerable quantity of flower-pots. Prof. von. Eichwald had them all removed, and from that day the cure was assured and no more relapses occurred.

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Etiology of Malarial Fever.

Under the auspices of the National Board of Health, Dr. G. M. Sternberg, Surgeon U. S. A., has carried on a series of observations as to the etiology of malarial fevers, with a view of testing the accuracy of the statements of Klebs and Tommasi-Crudeli.

Dr. Sternberg found a great number of minute algæ, including bacteria of various forms, upon the surface of swamp-mud in the vicinity of New Orleans, and also in the gutters within the city limits.

It is evident that the pathogenic properties acquired by gelatine solutions and other organic liquids after inoculation with bacterial organisms are due, directly or indirectly, to the presence of these bacteria, for, if they are excluded, such fluids may be kept indefinitely without undergoing change, and are innocuous beneath the skin of a rabbit.

Some of the organisms found in swamp-mud, in gutter-water, and in human saliva are capable of multiplying within the body of a living rabbit, and the fluids and organs containing them (blood, serum from cellular tissue, spleen, etc.), possess virulent properties. In other words, an infectious disease is produced which may be transmitted from animal to animal by inoculation.

Among the organisms found upon the surface of swamp-mud, near New Orleans, and in the gutters within the city limits, are some which closely resemble and, perhaps, are identical with the *Bacillus malariæ* of Klebs and Tommasi-Crudeli; but there is no satisfactory evidence that these, or any other of the bacterial organisms found in such situations, when injected beneath the skin of a rabbit, give rise to a malarial fever corresponding with the ordinary paludal fevers to which man is subject.

The evidence upon which Klebs and Tommasi-Crudeli have based their claim of the discovery of a *Bacillus malariæ* cannot be accepted as sufficient; (*a*) because in their experiments and in the author's the temperature curve in the rabbits operated upon has in no case exhibited a marked and distinctive paroxysmal character; (*b*) because healthy rabbits sometimes exhibit diurnal variations of temperature (resulting apparently from changes in the external temperature), as marked as those shown in their charts; (*c*) because changes in the spleen such as they describe are not evidence of death from malarial fever; inasmuch as similar changes occur in spleens of rabbits dead from septicæmia; (*d*) because the presence of dark-coloured pigment in the spleen cannot be taken as evidence of death from malarial fever, inasmuch as this is frequently found in the spleen of septicæmic rabbits.

While, however, the evidence upon which Klebs and Tommasi-Crudeli have based their claims to a discovery is not satisfactory and their conclusions are shown not to be well founded, there is nothing in Dr. Sternberg's researches to indicate that the so-called *Bacillus malariæ*, or some other of the minute organisms associated with it, is not the active agent in the causation of malarial fevers in man. On the other hand, there are many circumstances in favour of the hypothesis that the etiology of these fevers is connected, directly or indirectly, with the presence of these organisms or their germs in the air and water of malarial localities.

The truth or falsity of this hypothesis can only be settled by extended experimental investigations, and while further experiments upon animals may lead to more definite results, it seems probable that the *experimentum crucis* must be made upon man himself.—*Supplement No.* 14, *Nat. Board of Health Bulletin.*

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Peptonuria in Acute Articular Rheumatism.

In twelve cases of acute rheumatic arithritis, R. JACKSCH detected, by Hofmeister's simple process, peptone in the urine, both after, and, indeed, during, the disappearance of the joint affection. The quantity of peptone was proportioned to the number of joints affected and the rapidity with which the joint effusion, either with or without treatment, was absorbed.

With the disappearance of the effusion the peptonuria also ceases, to appear again, however, in the repetition of the attack. The peptonuria was independent of the temperature.

It can be concluded in these cases that the peptonuria here, as was proved by Hofmeister and Maixner to be the case in the absorption of purulent effusion, pneumonic infiltrations, etc., was derived from the decomposition of the pus-cells in the effusion.

In this connection the following case is of interest:—

In a woman, aged 27, who had from youth suffered from a dermoid ovarian cyst, there occurred a sudden increase in the size of the tumour, due, as percussion revealed, to the development of gas. The patient lost strength, became extremely constipated, and was troubled with constant vomiting. Then the tumour suddenly collapsed, and the urine, which had previously contained traces of albu-

men, but no peptone, now contained large quantities of peptone until death occurred two weeks later, with the symptoms of ileus. The autopsy revealed a dermoid cyst, which was adherent in several places to the intestine, and contained besides gas an extremely fetid purulent mass, with hairs, epithelial scales, and cholesterine. Similar masses were found in the peritoneal cavity, between the occluded intestinal coils and in the pelvis.

In this case the appearance of peptonuria was evidently connected with the bursting of the tumour, as made evident by the external signs of its collapse, the peptone being absorbed by the peritoneum from its decomposed purulent contents.—*Centralblatt f. d. Med. Wissenschaften*, Oct. 29, 1881.

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Treatment of Erysipelas by the Salicylate of Soda.

MM. Bochefontaine and Hallopeau have shown that when compresses soaked in a neutral solution of salicylate of soda of the strength of 1–20, are placed on an articulation and covered with rubber cloth, the drug passes into the urine. The authors therefore thought that the drug so absorbed by the skin might produce a favourable action on erysipelatous inflammation: to determine whether their supposition was correct or not, in thirteen cases they applied compresses soaked in the solution, and frequently renewed, to the inflamed surfaces, with the internal administration of four grammes of the salicylate of soda; in three cases in a weak punch.

In almost all cases the temperature was decidedly reduced immediately after the commencement of the treatment with the salicylate; it can therefore be concluded that in this disease, as in typhoid fever, as much of the danger as depends upon the hyperpyrexia can be removed, or at least diminished, by the use of this drug. It also appeared that the duration of the disease was sensibly reduced, seldom reaching twelve days, the usual duration (Velpeau, Heyfelder, Zuelder), while in some instances the progress of the disease was suddenly checked. In only two cases the fever lasted to the tenth day, but in one of these cases the treatment was not commenced until the seventh day, and the other case was one of *wandering* erysipelas consequent upon adynamic pneumonia, and therefore one of greater severity. The accidents sometimes following the use of this drug in typhoid fever have not as yet been met with in the treatment of erysipelas; one of the patients was for a short time delirious, but no serious results followed, while another, an old man, attacked with purulent pleurisy after his erysipelas had disappeared, was very somnolent during the last two days. Nothing, however, proves that these accidents can be attributed to the salicylate of soda; it nevertheless appears prudent to cease the administration of the drug should head symptoms or dyspnœa occur. The authors believe that their observations show:—

1*st*. That salicylate of soda, employed in the manner indicated, reduces the temperature in erysipelas.

2*d*. That it often seems to reduce the duration of the disease.

3*d*. That it is not prudent to give the drug when head symptoms or dyspnœa are present.—*Journ. de Méd. de Paris*, Oct. 8, 1881.

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Treatment of Hydrophobia.

In the *British Medical Journal* for Nov. 19th, there are a number of papers on, with reports of, cases of this rare disease. Dr. Joseph Ewart has a paper on its Pathology and Prevention, and cases are reported by Mr. James Fowler, Mr. John Ruxton, Mr. W. S. Savory, and by Mr. F. A. Southam.

From a comparison of the different plans of treatment followed in the seven cases reported by Mr. Southam, he gives the following indications:—

1. Chloral and opium; administered as sedatives, in order to quiet the nervous excitement, and thus modify and allay the spasms by the direct action of these drugs on the nervous centres.

2. Chloroform and curare; given with the view of arresting the spasms by the special action of these agents on the muscles themselves, the one acting centrally, the other peripherally, on the nervous system.

3. Tracheotomy; performed in order to prevent death from asphyxia through spasm of the glottis.

4. The hot-air bath; employed with the view of eliminating the poison from the blood by means of the skin.

Of the four drugs made use of in these cases, chloral, by its sedative action on the nervous system, appears to give the most beneficial results, by prolonging life, and also by temporarily allaying the spasms, and in this way alleviating the sufferings of the patient. In the two cases in which it was employed, life was prolonged in the one instance for twenty-eight, in the other for fifty-one, hours after active treatment was commenced; in the remaining five cases, on the other hand (which came under treatment at much the same stage in the disease), and in which other plans of treatment were adopted, the patient did not, in any instance, survive for more than sixteen hours; so that, even though the action of chloral as a curative agent may be *nil*, yet, if it is a means of prolonging life even only for a few hours, valuable time is gained for the employment and trial of other remedies. Its administration by subcutaneous injection is a ready and effective method of giving the drug; much more so than by enema, as in the latter case there is the risk of causing an irritable condition of the rectum, and thus interfering with the employment of nutrient enemata, the only means of supporting the patient's strength. In neither case did the prick of the needle set up any spasm, nor was the injection followed by any evidence of local inflammation, though it is impossible to say whether abscesses might not have formed at the seat of injection if the patient had survived.

With respect to the action of morphia, though given in grain-doses frequently repeated, no such marked relief was observed as in the case of chloral; and I should be inclined to regard this drug as a remedy of much inferior value, both as a means of affording relief and of prolonging life.

With regard to the employment of curare, if it is to be administered until its toxic action is produced by causing general muscular paralysis, a new element of danger is introduced into the case; to insure success, it is obvious that the general paralyzing action of the drug must be produced, a necessary result of which will be paralysis of the muscles of respiration tending to asphyxia, to say nothing of the risk of inducing sudden syncope from its more remote action on the heart. In the two cases in which it was employed (in the one instance after two injections of one-quarter grain each at an interval of three hours; in the other after a single injection of one-sixth of a grain), alarming symptoms of failure of the respiratory power suddenly appeared, while at the same time no relief was afforded to the spasms.

Chloroform as a curative agent is absolutely useless; but, as a means of producing a temporary and complete cessation of the convulsions, and as an auxiliary for introducing food into the stomach while the patient is under its influence, it is not without value. During its administration, there is an entire freedom from all spasm; but, in the three cases in which it was employed, the convulsions returned on its discontinuance with all their former force. In Case 7, in which narcosis by this means was sustained uninterruptedly for four hours, I have no doubt that the fatal termination was hastened. The objection to its use is, the severe spasm which is excited on first attempting to bring the patient under its

influence. In Case 2, the convulsions were so violent, and such severe respiratory spasm was set up, that it was necessary to discontinue its use.

Tracheotomy has been advocated with the view of preventing death from sudden spasm of the glottis; but it will be found that, as a general rule, death does not take place from this cause, but rather from exhaustion and gradual failure of the heart's action, the patient sinking into a condition of complete coma, with abatement of all symptoms, respiration in many cases going on quietly and free from all spasm. In six of the preceding cases, this was the condition at the end; in one only, Case 5, was death due to spasm of the glottis. In Case 6, in which tracheotomy was performed, the presence of the tube in the trachea appeared to be a constant source of irritation, apparently causing the patient considerable distress.

With regard to the hot-air bath, which has been much lauded by writers as a cure for hydrophobia, and especially by M. Bouisson, who states that he not only cured himself, but also eighty patients who had been bitten by rabid animals, we must remember that rabies only develops itself in a small proportion of those bitten by animals suffering from this disease. In Case 3, in which this plan of treatment was adopted, and where the symptoms were very well developed, it very quickly afforded marked relief, all the spasms entirely ceasing, and the patient quietly dropping off to sleep. It did not, however, prevent a fatal issue; the patient dying, as has been described, from sudden spasm of the glottis, about two hours after it had been discontinued. Whether the result might have been different if it had been continued for a longer period, it is impossible to say; but I think that if any real benefit is to be derived from this plan of treatment, it should be employed at the very commencement of the disease, with the onset of the earliest premonitory symptoms. From Cases 6 and 7, in which it was also used, no inference as to its curative value could be drawn; for, in the one, the patient was completely anæsthetized; in the other, tracheotomy had been performed, and the irritation of the tube seemed to favour the production of spasm.

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The Relations between Syphilis and Locomotor Ataxy.

The question whether syphilis should be looked upon as a frequent, or indeed the principal, cause of locomotor ataxy, has recently been much discussed, most of the French and English observers being strongly in favour of this view, while our German *confrères* have expressed the contrary opinion. Dr. Julius Althaus has recently added his experience in the etiology of ataxy to the facts already published, and has with this view analyzed a thousand consecutive cases of nervous affections which have been under his care in private practice, with the object of discovering the part which syphilis has played in their causation. Amongst these thousand cases there were—206 of epilepsy; 101 of neurasthenia, or nervous exhaustion, without evidence of substantial lesions of the nervous system; 77 of hemiplegia owing to cerebral hemorrhage or softening; 51 of neuralgia; and 32 cases of ataxy with the fully developed symptoms; the remainder of the cases being such as hysteria, infantile paralysis, local paralysis, muscular atrophy, anæsthesia, chorea, tumour of the brain, impotency, paralysis agitans, torticollis, etc. In 29 out of the 32 cases of ataxy there was a syphilitic history; and in these 29, secondary symptoms had occurred in 28, while in one of them there had been a soft chancre and a bubo, but no secondaries.

These results are certainly startling, as they show a percentage of 90.6 in favour of the syphilitic origin of tabes dorsalis, which is higher than that found by Gowers (70) and Erb (67). They become even more striking on being compared with the percentages found for the other nervous affections, inasmuch as of 206 cases

of epilepsy only 10, of 101 cases of neurasthenia only 12, of 77 cases of hemiplegia 5, and of 51 cases of neuralgia only 2 had been preceded by syphilis. The percentages are therefore as follows:—

Ataxy was preceded by syphilis in				90.6	per cent.
Neurasthenia	"	"	"	11.8	"
Hemiplegia	"	"	"	6.2	"
Epilepsy	"	"	"	4.8	"
Neuralgia	"	"	"	3.9	"

There were 6 additional cases in which paralysis of the ocular muscles, shooting pains, and sexual debility rendered it probable that sclerosis was developing in the posterior columns of the cord, and in 4 of these there were syphilitic antecedents. These cases, however, were lost sight of before the symptoms had become unequivocal; and, as they all occurred some time before the loss of the patellar tendon-reflex was utilized for the diagnosis of this disease, the author thinks it better to exclude them. Yet it is a significant fact that in 4 out of these 6 doubtful cases syphilis should have previously occurred, giving a percentage of 66.6. If we were to add them to the fully developed cases, the percentage of the whole would amount to 86.8.

With regard to the interval which had elapsed between the first symptoms of syphilis and of tabes, it was found that the former had preceded the latter upwards of twenty years in 2 cases, between ten and twenty years in 7 cases, between two and ten years in 19 cases, and eighteen months in 1 case. Amongst the 3 cases in which there was no history of syphilis, the affection was attributed in one to an operation for piles, in another to an accident in a tram-car, and in a third to exposure to wet and cold. The age at which ataxy became devoloped was from twenty-one to forty-five, and all the patients were males. It is to this latter circumstance that Dr. Althaus attributes the higher percentage of syphilitic antecedents in his cases, as ataxy in women is generally not preceded by syphilis. In all his cases, one or another of the ordinary causes of ataxy, such as accidents, over-exertion, combined with the influence of wet and cold, and sexual or alcoholic excesses, were mentioned as having lead to the outbreak of the complaint.

An overwhelming numerical testimony is thus clearly exhibited in favour of the view that tabes is habitually preceded—it is not said produced—by syphilis. But the real question at issue is whether syphilis is the originator of ataxy, or merely an accidental concomitant of it. The length of time which had generally intervened between the outbreak of the two diseases does not speak against their standing in the relation of cause and effect. Sir Benjamin Brodie met with an accident while riding on horseback in 1834, dislocating his right shoulder, and he eventually died of cancer which had become developed in the same joint in September, 1862, which gives an interval of twenty-eight years between the injury and the consecutive disease. It would not be difficult to multiply such examples. Other considerations, however, serve to show that ataxy is a disease *per se*, which occurs without any syphilitic taint whatever, but which may, like so many other diseases, be imitated by syphilis under certain circumstances.

1st. Tabes has unquestionably existed in Europe long before the first appearance of syphilis in this quarter of the globe.

2d. Numerous cases of ataxy are on record, more especially as having occurred in women, where no syphilitic affection whatever had preceded it.

3d. Ataxy is not a common or inevitable consequence of syphilis, as, for instance, roseola or sore-throat, but only appears to become developed in the syphilitic, if they have the neurotic constitution, and of other causes, such as accidents, excesses, and the influence of wet and cold, etc., have also been active.

4th. Treatment by iodide of potassium, even if used perseveringly and in large doses, is only exceptionally useful, even in cases with a pronounced syphilitic history, while the exhibition of nitrate of silver, ergot, the continuous galvanic current, nerve-stretching, and general remedial measures which have the tendency to improve the condition of the central nervous system, but which have no influence on the syphilitic diathesis, are frequently productive of beneficial results.

5th. The same disease—sclerosis—occurs in the lateral columns of the spinal cord, more particularly in young women who have never been exposed to venereal infection.

6th. Syphilis may, however, imitate ataxy (to use an expression of Mr. Jonathan Hutchinson), just as it imitates iritis, lupus, rodent ulcer, and other diseases. Clinically the symptoms of syphilitic and non-syphilitic tabes appear to be identical. That ataxy should be so frequently associated with syphilis is probably owing—first, to the fact that syphilis, like masturbation and other excesses and irregularities, deteriorates the nutrition and power of resistance of the central nervous system; and second, and more particularly to the specific tendency of the syphilitic virus, to lead to low forms of local inflammation, which, when once established, are apt to spread in certain definite paths. Where this kind of inflammation attacks the posterior root zones of the spinal cord, it will produce the clinical aspect of locomotor ataxy, being aided in its development and further progress by the natural tendency of spinal disease to invade symmetrical and homologous anatomical and histological portions of the organ.—*Lancet*, Sept. 17, 1881.

The probability of a causal connection between syphilis and tabes dorsalis, insisted on by Althaus, Erb, and others, has received confirmatory proof in some statistics recently collected by Dr. Voigt.

Of 43 cases of typical tabes in adult males observed by Dr. Voigt, 29—*i. e.*, 67 per cent.—had had primary syphilis, and had been specifically treated for it, 8 of them showing no secondary symptoms. Of the remaining 14 cases, only 9 gave definitely negative histories in the matter of syphilis. The percentage of syphilitic cases is lower than Professor Erb's, a fact which may partly depend on the smallness of the number on which it is calculated. Smaller though it is, however, it is much in excess of the proportion of syphilis among patients generally, which Professor Erb makes to be 23 per cent. As to causes of tabes other than syphilis, in 22 syphilitic cases, and 9 non-syphilitic, the patients were unable to state any cause whatever, while exposure and fatigue, the commonly alleged causes, were blamed by only two patients in each class. In no single case was sexual excess given as the cause of the disease, and it is to be noted that tabes occurs least often at that age when sexual excess is most common, and when the nervous system is least resistant. Comparison of the syphilitic and non-syphilitic cases naturally suggests itself, and this Dr. Voigt gives us, in respect to the following points: 1. Age of occurrence. In both classes the maximum is from thirty to fifty years. 2. First symptom occurring. In both classes the large majority of patients complained first of the tabetic "lightning pains." 3. Other symptoms. These are in the main precisely parallel, any slight differences being evidently dependent on the small number observed. Seeing, then, that on these points a detailed and careful comparison fails to bring out any distinction between syphilitic and non-syphilitic cases, such, for example, analogically as exists between the syphilides and the cutaneous diseases they imitate, it is manifest that, so far as these statistics can prove it, syphilis does not in tabes act as a specific disease-producing influence, but as a general influence disturbing perhaps the nutrition of the organism generally, or of the nervous system specially.

Is tabes a manifestation of syphilis in the ordinary sense of the term? Then,

as practical physicians, we should expect a strong corroboration in the effect on it of specific anti-syphilitic treatment. Here, however, Dr. Voigt's results agree with those of other physicians. In four cases of recent tabes treated energetically with mercurial inunctions he saw no benefit whatever; in a few others there was a marked deterioration under the treatment; while in no single case was there the slightest improvement from the use either of mercury or iodide of potassium. Brine baths and galvanization produced improvement of certain definite tabetic symptoms in twenty-one syphilitic and eleven non-syphilitic patients, and here again the general result, as well as the detailed improvements, were precisely parallel in the two classes.

While, therefore, the statistics given point to a causal connection between syphilis and tabes dorsalis, it cannot be said that the question is more than *sub judice.—Med. Times and Gazette*, Nov. 19, 1881.

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Case of Charcot's Joint Disease.

At a recent meeting of the Clinical Society of London (*British Medical Journal*, Oct. 22, 1881), Mr. C. B. KEETLEY read particulars respecting this case, and exhibited the patient. He was a shopkeeper, aged 34, married ten years, having three healthy children. Up to October, 1880, no other symptoms than the following had been noticed: (1) slight "weakness on the legs," of twelve years' duration, and attributed by the patient to the lameness occasionally produced by a "corn" beneath the right great toe; (2) pains in the muscles, described as rheumatic; (3) attacks of diarrhœa, occurring fortnightly for long periods at a time. But, in October, the "corn" ulcerated, and the corresponding great toe became greatly swollen. About a week afterwards, the hip, groin, and thigh of the same side (the right) swelled enormously, but were pale and comparatively free from pain; *i. e.*, such pain as did exist was not synchronous with the occurrence of the enormous swelling. A deep fluctuating point being opened towards the lower part of the front thigh, several ounces of synovia, or a synovial-like fluid, escaped. In two months the patient was able to stand again, and move the joint freely; but there was then discovered an inch and a half of shortening, a tendency to eversion, and a peculiar "scrunching" or crepitus on manipulating the hip in a certain manner. The joint was also somewhat loose. Apparently, the head of the femur had disappeared. From this time, for nine months, the limb steadily increased in usefulness; the power of spontaneously rotating it both inwards and outwards seemed also to return. But then the left hip was attacked exactly like the right, though not so acutely. This attack came on whilst the patient was being severely purged by two pills and two black draughts, prescribed by a chemist on a theory that the patient looked "bilious." While the swelling of the left hip was subsiding, after the manner of that on the right side a year before, severe pains attacked the front and inner side of the left thigh, and the left knee also, but passed away after some hours. At present, the patient had only occasional slight pains in the left thigh, but great numbness on the front aspect above the knee. He could already get about on crutches, and even stand without them. There was now evidence of the left hip having undergone anatomical changes like those of the right. The right great toe joints had been also deformed since the swelling thereof twelve months ago. The corn was represented by a thin red scab.

There were various symptoms of tabes dorsalis besides those above mentioned. These were loss of patellar tendon-reflex, of iris-reflex, of the power of standing with the heels together and the eyes shut, partial loss of sensation in the outer sides of both feet, perverted sensation in the right foot, slight deafness of the left

ear, and (?) an ataxic gout disguised by the joint-affections. And, though there were no gastric crises, there were what might be termed "intestinal crises," viz., the above-mentioned periodical attacks of diarrhœa. In the case of each hip, the subsidence of the general swelling left a marked enlargement of the inguinal glands, which persisted some time. The internal treatment had been iodide of potassium with salicylate of soda, five grains of each, three times a day. Was it justifiable to try nerve-stretching in this case? There were some grounds for entertaining such an idea. In most of the cases, now not few in number, in which nerve-stretching had been done for the lightning pains, general as well as local, benefit had accrued, not only by way of lessening the pain, but also by diminishing, or even removing, the inco-ordination. And the same general improvement, as regarded the whole neurosis, had been observed in leprosy, when the pains of that disease had been treated by nerve-stretching. Done antiseptically, it was by no means a very serious proceeding. Moreover, to do nothing in such a case as this did not secure for the patient a very good prognosis. If the speaker had any evidence to show that nerve-stretching had checked the visible changes in the skin in leprosy, he would be still more inclined to try it. Could any of his hearers speak as to that point?

Dr. Dyce Duckworth thought the cases of this disease must be much more common in France than in this country. Sir James Paget, at the recent International Medical Congress, stated that he had not seen such a case in any museum, nor any living example of the affection; and he was invited to ask Professor Charcot to describe the cases in question. Dr. Benjamin Ball first described the ulceration of the feet. As regarded the question of nerve-stretching as a mode of treatment, some good observers were opposed to it.

Dr. Buzzard remarked that a similar ulceration of the toe had occurred in a case reported to the society by Dr. Greenhow ten or eleven years ago. The ulceration was due to a trophic change connected with disease of the nervous system. The diarrhœa of this case, consisting of three or four liquid motions a day for two or three days, had for years come on every fortnight or so. He also had heartburn; but there was no vomiting. He (Dr. Buzzard) had suggested an association of tabetic arthropathy, with the "gastric crises" mentioned by Charcot; he had seen the latter six times in nine cases of the former in his own practice. He thought the gastric crises were due to sclerosis of the posterior cornua of the spinal cord, continued up to the medulla oblongata, there influencing the vagus, and that possibly in that part of the nervous system was a centre which presided over joints. Such a centre would explain the relationship of acute rheumatism and heart-disease. The muscles in the neighbourhood of the affected joints exhibited only normal excitability. In this patient the periodical diarrhœa and heartburn might be taken as an equivalent of the gastric crises.

Dr. Althaus considered the case a very rare one. The œdema present here from the commencement of the joint-affection was not usual. The early joint-swelling was generally hard, not œdematous. As regarded the union of gastric crises and joint-affections, the former he declared frequent, but the latter very rare; so that he did not think there was much connection between the two. As to the centre in the medulla oblongata supposed to preside over the joints, it was an ingenious supposition, but could not at present be proved. The pathology of the disease was mysterious, and it was difficult to see how the joint-affection came about. It had been suggested by Professor Volkmann that the joint-disease was due to injury received by ataxic patients. But he (Dr. Althaus) did not consider this correct, as it often occurred in the early stages of tabes, even when the ocular symptoms were the only ones that could be recognized. This patient had

had no injury to his joint. As regarded the operation of nerve-stretching, it might perhaps be done advantageously in certain advanced cases.

Mr. H. PAGE said that, until quite lately, the museum of the Royal College of Surgeons had contained no specimens of the joint-disease in tabes. But, at the International Medical Congress, Mr. Macnamara had exhibited two specimens of hip-disease in ataxy; and a patient in St. Mary's Hospital was walking along, when he suddenly felt his hip "give way," and the limb suddenly become three or four inches shorter than the other. He was subsequently discovered to have ataxy. Mr. Page had exhibited, at the Congress, a patient having large joints of the foot, the bones of which moved freely on one another, and the movement gave no pain. He had such sores on the feet as were found in these other cases, and he had called them "gathered corns." They were not very painful, and he was examined and found to have well-marked tabes dorsalis. Whilst under observation, the other foot had become enlarged at the tarsal and ankle-joints, and the bones were freely movable upon one another, as if the foot were a bag containing loose bones. He (Mr. Page) had kept that second foot at rest, as the first had been so treated, and had been cured. The patient had left the hospital with the foot in plaster-of-Paris bandage, and was much improved. He had never had pain in the parts affected; but had gastric and intestinal crises, and profuse hæmaturia, for which no surgical cause could be discovered. Physicians and surgeons must have their eyes open to look out for these patients. The patients often had as yet no ataxic symptoms; they could still walk with their eyes shut.

Mr. LISTER remarked on the rarity of the affection. He had seen one case of the kind under one of the surgeons at King's College Hospital. Perhaps it was the very rarity and abnormality of the cases which kept them out of museums.

Mr. KEETLEY, in reply, stated that a patient might have ocular and other symptoms for years before he became ataxic. This patient had not his knees affected. The joint-disease was liable to be bilaterally symmetrical. The disease was not likely to be mistaken for any other disorder. This man's hip and thigh were much more swollen after being affected for one week, without there being any pain, than were any other hip or thigh he had ever seen affected with any other disease, and yet in two months the swelling was nearly all gone, the limb was shortened; and all this had occurred with scarcely any pain. The disease certainly had most distinct features, and was easily recognizable.

Scorbutic Spinal Hemorrhage.

Dr. PETER EADE reports the case of a farmer's daughter, aged 13, who had been long ill, viz., for four or five months, with cough, expectoration, and subacute inflammatory symptoms in the chest; and who was then suffering from severe pain and constant spasmodic startings and jerkings of both her legs and thighs, with which she had been seized quite suddenly five days before.

At his visit, she was lying in bed upon her back with the shoulders raised, in a most constrained position, with the hand of a nurse firmly pressing upon both her thighs so as to keep them down and steady, and to prevent the constant painful jerkings of the limbs which immediately took place when this restraining force was removed.

This condition, we were told, had existed continuously for the preceding forty-eight hours, both through the nights and days; and, although she had been somewhat quieted by the opium, yet she begged, or almost insisted, upon the hands being never removed; and the nurses had, in fact, most unweariedly kept up

their irksome and straining attentions, and had been kneeling by the bedside, doing this, for all this time.

She was noticed to be very pale and thin, though mentally clear and bright; and, on inquiry, it appeared that her history was bad, she having lost several near relatives from consumption; also that, ever since the age of one year, she had herself suffered from otorrhœa and partial deafness, and that, for the last four months, she had been suffering from lung disease, consisting of subacute pleuropneumonia, terminating in abscess at the base of the left lung. On examination, dulness, feeble breathing, and large moist sounds were found to be still present at the left base. The heart's sounds, though free from *bruit*, were also heard over a large portion of the left side.

On further examination her pulse was found to be small, weak, and quick, and her temperature to be 100° Fahr. The urine was free from albumen. There was also entire freedom from pain along the spine, as well as in the limbs when the spasmodic startings were restrained. And it was found that sensation in the legs was unaffected, and that no spasmodic jerkings were produced by merely touching the skin, although the spasms immediately recommenced directly the pressure of the nurse's hands was removed from the thighs.

Taking into consideration the febrile temperature, the strumous history, the recent and still existing thoracic disease, the most feasible diagnosis now appeared to be that of some form of scrofulous disease, affecting the spinal cord and its membranes, either directly, or by propagation from the diseased chest; but, on still further inquiry, it appeared that, for the preceding two or three weeks, she had had recurring small hemorrhages under the skin of the legs, and it was also elicited that she was of a very peculiar nature and habits, that she had a great dislike to vegetables and fruit—indeed, was scarcely ever known to eat any, except on the most rare occasions—and that her habitual diet consisted of meat, or beef-tea, and bread.

Taking these additional facts into consideration, even although there was an absence of sponginess of the gums or other hemorrhagic conditions, Dr. Eade finally arrived at the opinion that she was really suffering from scurvy, that there had been a scorbutic hemorrhage into the membranes of the lower part of the spinal cord, that the paralysis and spasm—the spastic paralysis—was due to this, and possibly that much of her generally diseased condition might also be due to the depraved condition of her blood.

Acting upon these views, he decided at once to put her upon small and frequently repeated doses of lemon-juice, and to give her in addition nothing but a few drops of tincture of belladonna, or some opium, if the restlessness required it. The result was most satisfactory. The symptoms, after four or five days, began slowly to amend. The startings gradually subsided; the hemorrhages did not recur; and soon she began to regain some power of movement in the legs, and in due time to be removed from her bed; and, on September 30th, she could stand and walk.

It will thus be seen that the progress of this case, under merely antiscorbutic diet, exceeded the most hopeful anticipations. At the visit on August 9th, the prospect appeared most gloomy, and the prognosis given was most grave; but the girl was, at the end of six or seven weeks, up, and walking about with the aid of sticks or the arm of a friend, and was very greatly improved in health and general appearance. The lemon-juice was continued up to the end of September, and it may be said most distinctly that, within a very few days of its commencement, the improvement had commenced, and was going on.—*Brit. Med. Journal*, Nov. 19, 1881.

The Pathology and Treatment of Certain Forms of Neuralgia.

An elaborate article on this subject, by Dr. C. LANGE, of Copenhagen, has been published in the *Hospitals-Tidende*, Series 2, Band vii. pp. 701, 721, 781, 801, 821, and 849.

In several cases of sciatica, where the patient could not submit to a long course of treatment, Dr. Lange had recourse to an old remedy—cauterization of the helix of the ear, by means of Vienna paste, with strikingly good result. Eight cases in which this treatment was employed are related. In a case of reflex sciatica (from renal calculus), in one of recent peripheral sciatica, and in a very old case, the treatment was without essential influence, with, perhaps, the exception in one case of some temporary alleviation; in the other five cases, very remarkable relief from pain was at once obtained, and continued as long as the control could be maintained, until the case ended, in the course of a short time, in complete or nearly complete cure. The author admits that this treatment is attended with the disadvantage of leaving the ear deformed by scars.

Dr. Lange remarks that neuralgia in the region of the supra-orbital nerve presents a number of peculiarities which are generally not rightly estimated. Thus it presents an usually perfectly regular intermittent type. This is generally attributed to an assumed connection with malarious infection, which, however, the author believes to be by no means the rule, and certainly has not been the case in his experience. Another peculiarity is the tendency of the affection to periodicity. It is very common to see it appear for two weeks or longer, and then cease, returning after the course of several months. Sometimes it appears at certain times of the year. Moreover, the pain appears in many cases on both sides, either being first confined to one side, and then, after the course of some time, being felt in a slighter degree on the other; or commencing on both sides, and afterwards being limited to one; or, finally, affecting first one side and then the other. It attacks by preference young individuals; but the author has never seen a case under twelve years of age. The prognosis appears to be good, and the action of galvanism (the constant current, the anode being placed over the supra-orbital nerve) is well marked.

Regarding the diagnosis of tabes dorsalis in an early stage, Dr. Lange makes some remarks founded on a considerable number of cases, several of which are related. He gives first a case in which the initial pains were absent; this, however, he regards as being very rare. He next remarks that they by no means always commence in the legs. In the first case related in illustration of this fact, the pains began in the thorax, and afterwards affected the upper limbs; after this, there were anæsthesia of the chest and dysæsthesia of the hands; in the lower limbs, pains and anæsthesia did not appear until later. In the next case, the patient had for many years only pain in the chest, of a rather vague nature, and not presenting the character of intercostal neuralgia. In another case, there were at first constricting pains about the chest; then followed anæsthesia of the body and upper limbs, and ataxy of the arms; and, later on, pains and ataxy of the lower limbs. In another case, pain and dysæsthesia, and afterwards ataxy, occurred in the arms before the phenomena of the disease were met with in the legs.

Another circumstance which may cause difficulty in making the diagnosis of tabes in the earlier stages is the limitation of the symptoms to one side for some time. This also may be regarded as a rare occurrence; but that it may occur is sufficiently proved by a case related. In this case, the morbid phenomena first appeared in the trunk. Dr. Lange also relates several cases of rapid, truly acute tabes, not, as is usually the case with the cases described as acute, preceded by a premonitory stage. In one case, the disease appeared after exposure to cold and

damp (there was, however, a history of syphilis); in another, the patient was attacked during convalescence from an acute illness. Dr. Lange ascribes no small diagnostic importance to the absence of the knee-phenomenon. He relates, however, a case in which it was abnormally strong. He has had about eighty cases, of which four have been quite cured.—*London Med. Record*, Nov. 15, 1881.

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Cardiac Symptoms of Chorea.

Dr. O. STURGES (*Brain*, July, 1881) summarizes the several factors of the heart symptoms thus: 1. In the course of the chorea of childhood the heart's action is apt to become irregular or uneven, and its first sound to be followed by apex-murmur, which is variable in pitch, influenced by posture, seldom audible in the axilla or at the angle of the scapula, and which disappears along with, or shortly after, the chorea, the heart and the circulation suffering no injury. 2. This liability on the part of the heart to what, from its signs, would seem to be a functional disturbance, is independent of the violence or method of the chorea, but dependent upon the age of the patient, the younger children being the most, and the elder the least, liable, while beyond childhood there is little, if any, liability of the kind. 3. These heart-signs of chorea—acute rheumatism being excluded—give rise, as a general rule, to no symptoms whatever affecting the health or comfort of the child. They make no apparent difference to the prospects of recovery, or to the structural integrity of the heart. Nevertheless, choreic children having this murmur, and happening to die, either with or shortly after recovery from chorea, very commonly exhibit a beading of recent lymph on the mitral valve. Such, he says, are the chief statements which statistics seem to warrant. To these he adds another, which, so far as he knows, has never been statistically reckoned, but which no one will gainsay. It is, indeed, the most constant of all the heart symptoms of chorea, and met with at a later age than the rest. He refers to the acceleration of the heart and pulse.—*London Med. Record*, Oct. 15, 1881.

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Paralysis of Hands and Feet from Disease of Nerves.

In a paper read before the Medico-Chirurgical Society of Edinburgh, on March 2, 1881, Dr. GRAINGER STEWART has called attention to a form of paralysis, of which hitherto little has been known. He describes three cases of what he named peripheral paralysis; and, in one instance, he was enabled to verify his diagnosis by *post-mortem* examination.

In his own words, the clinical characters of this disease are "the co-existence of symptoms referable to the sensory, the motor, and the trophic functions of the nerves; the localization of the symptoms in the feet and hands, the intensity being greatest at the most distal points, and the affection corresponding to certain districts of the extremities, and not to the distribution-areas of particular nerves." He remarks that such symptoms cannot be referred to disease, either of the brain or of the spinal cord; and hence he infers, by a process of exclusion, that the nerves themselves are involved. In the fatal case, the median, ulnar, and tibial nerves were particularly affected. Microscopically, it was found that certain bundles of nerve-fibres had undergone what appeared to be fatty degeneration. The axis-cylinder was swollen, and presented a number of rounded masses resembling colloid bodies in every respect. In some instances, these bodies had undergone fatty degeneration, and the result was the formation of compound granular corpuscles. Some of the nerve-fibres were completely destroyed, and were replaced simply by fibrous tissue. Secondary degeneration of the columns of Goll and of the direct cerebellar tracts was observed in the cord. Dr. Grainger

Stewart thinks that the change could not possibly have arisen in the muscles, since the sensory disorders preceded the motor. Unfortunately, he is unable to give any precise information regarding the nerve-endings, but he strongly inclines to the belief that the disease originated there, and spread upwards. From the fact that the disease begins simultaneously, or nearly so, in both hands and feet, it seems probable that the affection depends on some constitutional cause.

After noticing the few cases of this disease on record, Dr. Stewart proceeds to give a summary of its clinical features. The commencement is usually acute, and attended by more or less pyrexia. The first changes occur in the sensory functions. Sometimes there is acute pain, but more frequently numbness or tingling in the affected parts, and, at the same time, more or less anæsthesia. These sensory disorders occur usually in both hands and feet simultaneously. Paresis affects the most distal parts at first, and then extends up the limb from one group of muscles to another. In rare cases, the normal functions of the bladder and rectum are interfered with. The skin-reflexes are sometimes absent, but are present to an exaggerated extent on the application of a strong stimulus. The patellar reflex is usually lost at an early stage, but ankle-clonus may be present even when the "knee-jerk" is absent. Voluntary motion rapidly diminishes, the patient at the end of a week often being unable to flex or extend the toes and fingers. There is no marked loss of co-ordinating power. Trophic changes are indicated by the rapid muscular atrophy, by congestion and glossiness of skin, by malnutrition of the nails, and by some degree of œdema. The progress of the disease is towards recovery, but there is a marked tendency to recurrence. It is probable that many cases which were formerly ascribed to spinal congestion and myelitis, are really dependent on a similar change to the one now described. This disease resembles Landry's acute ascending paralysis; but in this latter affection the motor functions only are involved and no marked pathological change has been noted. It may be, however, that these processes are related.

Dr. Grainger Stewart suggests that the premonitory, but transitory, attacks of paralysis, involving certain nerves in locomotor ataxy, may be explained by assuming them to be due to peripheral disease. Dr. Hamilton's pathological researches have led to the same conclusion, and a further corroboration is afforded by the beneficial results of nerve-stretching. As regards treatment, ergot of rye has been found useful in the early stages; and strychnia, with friction, electricity, and exercise when the acute period has passed. [It is interesting to observe, that M. Charcot, in his *Leçons sur les Localisations dans les Maladies du Cerveau et de la Moëlle Epinière*, pp. 261–262, suggests that secondary spinal degeneration will doubtless be found, in some cases, to be dependent on lesion of the peripheral nerves. He was then acquainted with only three or four cases of this kind. In all, the lesion was situated external to the cord, on the roots of the cauda equina. In the lumbar region, the whole posterior column was degenerated, but higher up the columns of Goll alone were affected.—*Rep.*]—*London Med. Record*, Oct. 15, 1881.

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Myxœdema.

M. MORVAN, in the *Gazette Hebdomadaire*, August 26, and Sept. 2, 9, and 16, reports fifteen cases of myxœdema, from the study of which he reaches conclusions not entirely in accord with the opinions of others. He says that the anasarca, though always marked, is never extreme, and that the amount of it varies with the temperature, being more pronounced in winter than in summer. In his cases it was exceptional for œdema to appear to any extent in the mucous

membranes, and he regards the roughness of the voice and the constipation occurring in the disease as due to paralysis of the nerves supplying the larynx and the muscles of the intestine, rather than to œdema. The complexion of his patients was generally good, and he has not noticed any change in regard to the skin. Speech is slow, the movements of the tongue are embarrassed, and the voice is rough. The patients walk with difficulty, and are unable to run; the upper extremities are feeble, and the fingers lose their dexterity, especially if the hands are put into cold water, when they can neither be opened nor shut completely; and these symptoms he believes to be paralytic. Sensation remains intact. On the part of the brain, vertigo, somnolence, delirium, and hallucinations were met with. The patients complain of cold. The course of the disease is slow, and its duration considerable. As to etiology, almost all the cases occur in the female sex; mostly in adults in middle life; in no case was a woman attacked before menstruation had appeared, but it has occurred in men; in nine out of fourteen cases it appeared at the menopause; it is possible that rapidly-recurring pregnancies may be an exciting cause as well as prolonged lactation; it may be hereditary, or due to nervous impressions; it attacked the peasant class most frequently. A humid climate probably predisposes to it, and it appears most often in winter. The disease is a neurosis of the central nervous system, affecting the afferent portion of the motor nerves, both of animal and organic life, they becoming paralyzed.—*New York Med. Journ.*, Dec. 1881.

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Modern Remedies for Pertussis.

Professor HEUBNER, of Leipzig (*Wiener Med. Woch.*, No. 32, 1881), gives a statistical table of the effects of some modern remedies for whooping-cough. In one column he gives an analysis of the effects of the bromide of potassium, quinine, chloral-hydrate, salicylic acid, and belladonna. The comparative value of potassium bromide is shown by a comparison of twenty-three uncomplicated cases. In not one of these was the duration of the disease shortened, but, on the other hand, in nine of the cases the intensity of the paroxysms as well as their frequency was diminished. In respect to quinine (administered internally in small doses, not exceeding 4½ grains per day), Heubner observed three times, in eleven uncomplicated cases, an abbreviation of the duration of the disease, while the paroxysms also in five cases underwent a favourable resolution. Chloral-hydrate was given internally in two cases, in divided doses; in all the rest by one enema daily, containing a larger quantity. A diminution in duration of the disease was observed only twice in ten cases, while resolution of the individual paroxysms took place six times, and even to a greater degree than under the treatment by quinine. Salicylic acid was given internally but once, being administered at other times by inhalation of a one-half to one-third per cent. solution three times daily, in the dose of thirty grammes, by means of Siegle's apparatus. In the seventeen cases thus treated, the effect upon the length of the disease was very unimportant, since only twice could a positive shortening be credited to it. The alleviation of the paroxysms, on the other hand, was very gratifying; for, in ten of the seventeen cases, the diminution of the severity or of the frequency of the seizures was very striking. At one time the intensity, at another the frequency, was favourably reduced, without any perceptible change in the other factors of the disease. Belladonna was for the most part administered in the form of the powdered extract, and in a few cases in the form of the powdered leaves, the daily dose being 2.5 and 5 grains; and in eight complicated cases, besides the immediate checking of the paroxysms, the duration of the disease itself was cut short by the remedy, the attacks becoming also milder. It thus

appears that, for the alleviation of the paroxysms, the inhalation of salicylic acid and chloral-hydrate promise the most positive results; while, for the abbreviation of the entire disease, the greatest benefit is to be expected from belladonna and quinine. Still these results are to be considered only relative.—*London Medical Record*, Nov. 15, 1881.

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Carbolic Acid in Whooping-Cough.

Dr. MACDONALD (*Edinburgh Med. Journ.*, 1881, p. 1094) says that on extended trial he finds carbolic acid, in doses of one-fourth of a minim to a child of six months, one-half minim for a year, and one minim for two years and upwards, to be the best remedy for whooping-cough. The whoop goes; the vomiting ceases; the paroxysms are modified in intensity and frequency. This result Dr. Macdonald believes to arise from an action similar to that of creasote on the motor fibres of the vagus to the stomach, and from a lowering of vitality of the specific germ of whooping-cough disease. This points to the antiseptic treatment of the zymotic diseases generally.—*London Med. Record*, Nov. 15, 1881.

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Treatment of Pleurisy.

Prof. DIEULAFOY, in a lecture upon this subject (*Gaz. des Hôpitaux*, No. 83), observes that the medical treatment of pleurisy has for its object the relief of the initial phenomenon of the disease, the pain—pain which irradiates over the whole side of the chest, and which may be localized in a point that may be exactly indicated by the patient. One of the most simple and efficacious means of relieving it is to apply dry cupping-glasses or with scarification to the painful part. Or hypodermic injections of morphia may be employed; and a very simple formula for this consists of ten centigrammes of chlorhydrate of morphia and ten grammes of distilled water, furnishing the proportion of one centigramme of morphia to one gramme of the whole, from half a gramme to not more than a gramme being injected at first. If these means do not succeed, we must have recourse to anodyne mixtures and to blisters applied *loco dolenti*. Blisters are of no other use than assuaging the pain, and should not be employed under the idea of effecting a derivation and diminishing effusion. They should not be made larger than a five-shilling piece. The first thing we are expected to do by the friends is to apply a blister, and the refusal to do this will incur blame; but the blister, without at all hastening the cure, impedes effectual auscultation and percussion, and therefore may prevent our ascertaining the amount of liquid effused. If, then, forced by the prejudices of the patient or his friends, we are compelled to apply the blister, this should be made as small as possible.

"When the fluid tends to increase, the family of the patient should at once be informed that an operation will probably be required. Its indications may be urgent or debatable. As to the first of these, if the patient has somewhat pronounced dyspnœa, complete dulness, and the tubular *souffle*, while from 2500 to 3000 grammes of liquid are supposed to be present, the operation should be performed at once, without waiting for to-morrow, when the patient may be dead. Hesitation here is entirely out of place. But under other circumstances, although the patient may have dulness, this is not absolute. There may even be a little sonority behind, above the spine of the scapula, and in front, opposite the clavicle. The heart is a little displaced if the effusion is on the left side; and the liver, if it is on the right side. The dyspnœa is not very considerable, and the liquid may be estimated at 2000 grammes. What are you to do here? Naturally enough, you are disposed to wait. The patient breathes pretty well, the cavity of the thorax is not filled, and you call to mind that thoracentesis has been accused of

inducing purulency. Nothing seems very pressing, and you go away, saying you will decide to-morrow. Next day you receive a message that the patient, without apparent cause, had been seized with a fainting fit and died. These cases are by no means so rare as you may suppose, death taking place when the liquid has not amounted to more than 1800 or 2000 grammes, as a consequence of syncope or of asphyxia due to pulmonary thrombosis formed *in situ*. Read Trosseau, and the examples which he gives of sudden death in his chapter on Thoracentesis. For my own part, I do not hesitate to lay down the rule, that whenever we estimate the quantity of liquid effused at about 2000 grammes, we must operate. If this is refused, give up the case, and do not accept the responsibility of what may happen. Remember that dyspnœa is a treacherous sign, and that the only true guide is the quantity of liquid effused, while complications do not contraindicate the operation.

"Thoracentesis is not always so clearly indicated, and there are cases in which it is debatable. You meet with cases in which there are effusions of 1200 or 1500 grammes that will not absorb. Are you to leave the patient with this fluid in his chest? This would not be prudent. Are you to apply blister after blister? I have punctured patients who have borne eight, ten, or twelve blisters without a drop of the effusion having been absorbed. In such cases, if there is any tendency to absorption, I merely wait. I order neither sudorifics, diuretics, nor blisters, and if at the end of thirty or thirty-five days the effusion has continued stationary, I propose thoracentesis, with which both the patient and myself have always been satisfied.

"For the operation, you puncture with the needle No. 2 in the eighth intercostal space on a line springing from the inferior angle of the scapula. I recommend you *never to remove more than a litre of the liquid at once;* for I do not hesitate to affirm that if any terrible accidents have succeeded the operation, this has been because two or three litres have been withdrawn at a time. It is much better to remove another litre next day, and the 300, 400, or 500 grammes that may still remain will be absorbed without any attention being required."

As to the transformation of a simple into a purulent pleurisy by thoracentesis, Prof. Dieulafoy entirely denies its possibility when the operation is properly performed with *quite clean instruments*. Those used at the hospitals are often very dirty. He maintains that thoracentesis is a very simple operation, which should be performed without hesitation.—*Med. Times and Gazette*, Nov. 19, 1881.

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Acute Pulmonary Œdema.

Dr. De La Harpe (*Revue Méd. de la Suisse*) calls attention to this serious and rare accident, which appears to be little recognized. The observations which he publishes on the subject are incomplete, inasmuch as the examination of the urine was not made, and it probably contained albumen. But whether the cases were examples of albuminuric œdema or not, the facts do not the less present real interest. The first patient, aged 43, went out in cold and wet weather, and had scarcely gone a few steps, when she uttered a cry, and fell, seized with mortal suffocation. She died a very few instants afterwards. In her last moments it was observed that there was easy and short respiration, accompanied with *râles*. It seemed that bubbling thick foam filled all the respiratory passages; moreover, foam of pure white colour, like eggs beaten into froth, escaped from the nostrils and mouth. An examination made some days before had shown that neither the lung nor the heart presented any appreciable lesion. Another patient, strong and robust, had already on different occasions been seized during the night with suffocation, which occurred unexpectedly and without known cause. One even-

ing he went to bed in perfect health. He was scarcely asleep, when he awoke with a bound, seized with sudden suffocation. He jumped out of bed, traversed the chamber, and seated himself in a chair, with the death-rattle in his throat. A few instants afterwards he was dead. He died with white froth escaping from the nostrils and mouth.

But cases of this kind are not always fatal. Dr. De la Harpe treated on a former occasion a patient who had analogous crises ten or fifteen times without succumbing to them. He went to bed in good health. Towards midnight, or one o'clock in the morning, he was awakened by a sudden depression, accompanied by mortal anguish. In a few minutes the distress became extreme, and the aspect livid; death appeared imminent. The means employed always ended, however, by producing an improvement in the course of an hour. During all this time respiration consisted of an easy inspiration and a prolonged expiration, during which bubbling was produced throughout the chest, and seemed to fill the trachea. In a word, the patient, who was well a few minutes before, assumed the aspect of a moribund person suffocated by a frothy liquid, which filled the respiratory passages, and against which he struggled with all the energy of which his muscles were capable. The treatment consisted of hot dry applications and internal excitants, such as ether, ammonia, either pure or benzolated, or with aniseed in strong and repeated doses. But in the most violent crises these remedies did not suffice, and several times it was necessary to resort to a method which would seem to be of all means the least opportune—bleeding; nevertheless, it always succeeded, and immediately the crisis terminated by rapid eructations and forcible emissions of almost colourless urine. A crisis of this kind recurred twice or more frequently in the year. The patient was 65 years old when first taken. Towards the end of his life these crises became frequent and less vigorous, intelligence became obtuse, strength diminished, and finally occurred a slight degree of cachectic, and the patient succumbed with a great deal diminishing of strength. Dr. De la Harpe thinks that in this case also there was acute œdema of the lung; but, as an examination of the urine was not made in these patients, the albuminuric origin of the symptoms may be considered probable.—*London Medical Record*, Oct. 15, 1881.

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Carcinoma of the Œsophagus with Perforation of the Left Auricle.

HINDENLANG reports in *Centralblatt f. d. Med. Wissenschaften*, No. 43, 1881, a case of carcinoma of the œsophagus which became adherent to the trachea and pericardium and caused necrotic softening of the left auricular and ventricular wall. The patient died from meningitis developed from emboli. Embolic infarctions were also found in the kidney, spleen, liver, and left parietal convolutions. Aphasia was also present. A somewhat similar case was published in the *Gazette Hebdomadaire*, in 1874, by M. Bertram.

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Case of Rupture of the Septum Cordis.

Professor AXEL KEY and Dr. KJELLBERG relate in *Hygiea* for 1880 (*Nord. Med. Arkiv.*, Band xiii. Häft 2), the case of a man, aged 75, previously healthy, who, in July, 1880, was attacked with pain in the chest, eructations, general malaise, and pain in the left arm. He recovered so much as to be able to go out daily, but soon afterwards had an attack of weakness in the right arm. From this he had recovered somewhat a month later; but one day after dinner he was suddenly seized with pain in the region of the stomach, a sense of oppression in the chest, and pain in the back on the left side. In the evening, his hands and feet became cold. Over the apex of the heart, and through a great extent, a

sharp systolic murmur was heard, replacing the first heart-sound, the heart's action was regular; the pulse could scarcely be felt in the right arm, and not at all in the left. He died during the night. At the necropsy, the heart was found to be somewhat hypertrophied. Nearly the whole of the septum ventriculorum was separated from its connection with the posterior muscular wall, and the posterior wall of the right ventricle was cleft for a very considerable extent. The rent began at the upper part of the left ventricle, about two-fifths of an inch from the aortic valves, and extended to the apex of the heart; for about four-fifths of an inch at the lower part it was complete, so that the two ventricles communicated. At the upper part, the rupture extended into the posterior wall of the right ventricle, separating into two layers. Nearly the whole surface of the rupture was covered with a thin and rather adherent layer of fibrin. The muscular tissue in general was flaccid, of a deep yellowish-gray colour. There were no essential changes in the valves or in the endocardium. The coronary arteries were in a state of advanced atheromatous degeneration, especially the right, the lumen of which, where it bent round the right border of the heart, was entirely filled with a firm adherent grayish-blue thrombus, rather more than an inch and a half long, and ending in a firm conical point. About two-fifths of an inch within, at the posterior part, the artery divided, and sent down in the ventricular furrow, behind the septum, a descending branch, which principally supplied blood to the ruptured part. No large ruptured vessel could be detected. Dr. Key says that the obstructing thrombus, in connection with the atheromatous degeneration, probably played the chief part in the production of the rupture. Probably, when the thrombus was formed, a rupture of a vessel with hemorrhage into the muscular tissue took place, producing distension of the muscular structure, which at last burst into the left ventricle, after which the rupture extended.—*London Med. Record*, Oct. 15, 1881.

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Functional Murmur in the Pulmonary Artery.

From an interesting article on this subject, Mr. C. J. NIXON draws the following conclusions:—

1. That a functional murmur in the pulmonary artery, independent of anæmia or of direct pressure on the trunk or branches of the vessel, is not of infrequent occurrence.

2. That the conditions, given in order of frequency, in which it occurs are:—

(*a*) Acute articular rheumatism.

(*b*) Enteric fever.

(*c*) Fevers where there is great prostration and a tendency to profuse sweating.

(*d*) Bronchitis, or œdema of the upper lobe of one or both lungs.

(*e*) Nervous diseases, such as paraplegia from myelitis, tubercular meningitis, or in a debilitated state of the system, generally associated with hysteria or hypochondriasis.

(*f*) Cases, where, as from extreme serous distension of the cavity of the peritoneum, the diaphragm is subjected to great pressure upwards.

(*g*) Trivial affections, such as diarrhœa, dyspepsia, etc., especially where there exists a tendency to the paralytic thorax. Here it is usually met with in young and imperfectly-nourished adults, and occurs more frequently in females than in males.

3. That from the various conditions under which the murmur occurs it cannot be regarded as a sign of any special disease. It is in most cases of temporary duration, and it may occasionally be met with in a state of apparent health.

4. That its characters closely simulate those of a murmur of attrition—hence it has, in many instances, been erroneously regarded as a sign of localized pericarditis.—*Dublin Journ. of Med. Science*, Sept. 1881.

Diagnosis, Pathology, and Treatment of Fatty Heart.

Our knowledge of the disease termed fatty heart cannot be said, more especially as to its diagnosis and treatment, to be of a very definite or satisfactory character. Hence as a basis for further advance we are disposed to welcome the *resumé* of its diagnosis, pathology, and treatment given by Professor STOFFELLA, of Vienna, in a lecture recently published (*Wien. Med. Wochenschrift*, 1881, Nos. 26-28).

After distinguishing between fatty infiltration—which Dr. Walshe calls "local obesity" of the heart—and fatty degeneration, or the precipitation of fat within the primitive fibres, which latter alone he means when he speaks of "fatty heart," Professor Stoffella goes on to say that the diagnosis of the disease, except in its immediate beginnings, is by no means especially difficult. He lays especial emphasis on the weak and usually toneless character of the heart-sounds, combined with the presence of the usual causes of fatty degeneration of the heart. He also notes the weak or imperceptible heart's impulse, the weak compressible pulse, usually intermittent, irregular, and slow. Dyspnœa, permanent or spasmodic, and frequent syncope, with the absence of valvular or pulmonic disease, also assist in the diagnosis. He fails to comment on the relative pulse and respiration rate, which Dr. Walshe has found in some cases 2 : 1 ; nor does he mention the valuable, while not, as was at first thought, diagnostic, symptom of the "Cheyne-Stokes' respiration." We fear, however, that, notwithstanding all known aids, the diagnosis of this disease will in many cases be unmade, or, if made, will partake more of the character of a probable guess than a scientific conclusion. One of the grounds on which, as we have seen, Professor Stoffella bases his diagnosis, is the presence of the usual causes of fatty degeneration. But while, as we shall see, there is a certain amount of sure etiological ground, outside that lies a residue of cases in which, beyond the hypothesis of a hereditary tendency, we must acknowledge ourselves ignorant of the cause of fatty metamorphosis of the heart fibres.

In discussing the pathology of fatty heart, Professor Stoffella commences with some account of the physiological deposition of fat. Twenty years ago, Voit and Pettenkofer showed that the direct source of the fat in the body is not the carbo-hydrates, starch, sugar, etc., but albumen. The overplus of albumen left circulating in the blood or other fluids of the body, after deduction of that used in tissue-formation, is broken up into water, carbonic acid, and fat, while, so far as it is perfectly oxidized, it leaves the body as urea and uric acid. The amount of fat deposited will therefore depend on (1) the amount of the "circulating albumen," and (2) the small relative supply of oxygen. As to other sources of fat, it is at least doubtful if gelatine forms fat, and of ingested fat only stearin, palmitin, and olein—the varieties naturally present in the body—go towards the production of fat. While, however, albumen is without doubt the direct source of fat, it is a manifest fact that gelatin, fat, and the carbo-hydrates help the production of fat in the body. This they do by oxidizing and splitting up more readily than albumen, thus using up the available oxygen, so that albumen is oxidized simply to fat, in place of to water and carbonic acid. By their oxidation, also, the carbo-hydrates spare the fat of the body, while, according to Voit, gelatine saves the blood and tissue albumen.

Parenchymatous fatty degeneration is fundamentally the same process as the physiological formation of fat—that is, the albuminous contents of cells imperfectly oxidized deposit fat granules as a part of the process of destruction, morbid or natural.

Fatty heart is thus, Professor Stoffella says, the expression of a disturbance of

nutrition, either purely *local*, as in disease of the coronary arteries or advanced fatty infiltration of the heart, or *general*, as in anæmia and chlorosis, in alcoholism, Bright's disease, the acute exanthemata, and all marasmic diseases. How comes this about? Two sets of experiments help us here. First, Dr. Litten has shown that the muscles of guinea-pigs kept for a lengthened period in a high temperature undergo fatty degeneration—first the heart, then the respiratory muscles, and lastly the body muscles, accompanied by changes in the blood corresponding to those in typhoid fever. Again, various Continental observers have shown that if dogs and other animals are subjected to successive bloodlettings, fatty degeneration of the heart supervenes. The result is the same in both sets of experiments, therefore, and the common point between them is the poverty of the blood in red corpuscles. But the red corpuscles are the oxygen-carriers of the body, therefore a deficiency of oxygen follows, resulting in an imperfect oxidation of the organic albumen in cells and tissues. The difference between the physiological and the pathological process is, that in the first the "circulating or store albumen" becomes fat, in the second the "organic or tissue albumen."

The treatment of fatty heart recommended by Professor Stoffella follows as a natural corollary from what has just been said. Deficiency in the oxygen-carrying red corpuscles being the cause of the disease, our object is to stimulate the blood-forming function. Our most valuable agent for this is iron, and this must be used with perseverance on the part both of doctor and patient. Should the digestion be unweakened, the best preparation, according to Professor Stoffella, is the sulphate of iron in the form of Blaud's pills. Niemeyer's formula for these is—℞. Ferri sulph. pulv., potass. carb. pur., āā ʒss, mucil. tragacanth. q. s. ft. mass. et div. in pil. xcvi. Of these Professor Stoffella gives three thrice daily, immediately after meals, to prevent cardialgia. Should constipation be present, add jalapin or extr. aloes aquos. Where digestion is weak, Professor Stoffella recommends the milder pyrophosph. ferri et sodæ solutum. The iron treatment must be continued for several months, combined with quinine or extr. quebracho should the dyspnœa and chest oppression be troublesome. When the degeneration occurs as a consequence of valvular disease, he would also give digitalis or quinine. The alkaline mineral waters, mildly purgative and containing iron, usually benefit much. The diet ought to consist principally of lean meat, with green vegetables, bread, eggs, milk, rice, and a fair allowance of wine. All fats, potatoes, beer, brandy, etc., are to be excluded. The carbohydrates, fat, and gelatine must, however, be allowed in restricted amount, as otherwise, from the difficulty of oxidizing albumen, muscular reparation and animal warmth suffer. Also, nausea and disturbance of digestion result very soon from an exclusively flesh diet, as seen in the Banting cure.—*Med. Times and Gaz.*, Oct. 1, 1881.

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Slow Pulse.

M. Laure (*Lyon Méd.* No. 32) brought a man, twenty-six years of age, to be exhibited at the Lyons Medical Society, with a very slow pulse. He had latterly suffered from attacks of syncope, a sense of oppression, and palpitation. A careful examination of his heart revealed absolutely nothing abnormal, and the sphygmographic tracing denoted a feeble amount of tension, and slightly resembled the tracing derived from aortic insufficiency. The pulse varied from twenty-six to forty in a minute, digitalis and bromide of potassium exerting no sensible influence on it, while the rate is always reducible to twenty-six or twenty-four if the patient attempts to run for a few minutes.—*Med. Times and Gaz.*, Oct. 29, 1881.

Calcareous Pericardium.

Hitherto, in text books and systems of medicine, calcareous pericardium has received but a sparing notice, and that under the heading of adherent pericardium. The cases on record are few and variously denominated; some are imperfectly described, and without history, so that their value for statistics is thereby much diminished. From the consideration of a case occurring in his own practice, in conjunction with others scattered throughout medical literature, Dr. EDWIN RICKARDS arrives at the following conclusions:—

1. Calcareous pericardium is the result of pyopericarditis, rather than, as is often held, the calcareous degeneration of the fibrous medium uniting the parietal and visceral layers of the pericardium formed during pericarditis; the pus in pyopericarditis undergoing caseation, and ultimately calcification.

2. The amount of calcification depends upon the amount of pus formed. In non-rheumatic pericarditis, the inflammation may stop short of suppuration, or the pericardial sac may contain a small or large quantity of pus. Hence, in adherent pericardium from non-rheumatic pericarditis, the pericardium may be free from calcareous matter, or may contain calcareous plates, or may be converted into a calcareous chamber. My experience in the *post-mortem* room does not tell of any case of rheumatic pericarditis where the pericardium contained pus, or where the pericardial adhesions were calcareous.

3. The calcareous matter situated between the visceral and parietal layers of the pericardium is almost exclusively confined to that part of the pericardial sac surrounding the ventricles; and, while having the consistency and chemical composition of bone, wants the structure peculiar to the latter.

4. Atrophy of the ventricles is more frequently associated with calcareous pericardium than hypertrophy. The two causes which appear chiefly to determine hypertrophy in adherent pericardium are adhesion while the heart is in a state of inflammatory softening, and valvular lesions. The pus in pyopericarditis becoming inspissated very gradually, time is thereby given for the heart to recover from any myocarditis which may have been present before adhesion takes place; and, when the pericardium becomes calcareous, the rigid casing by compression of the inclosed organ causes the heart to atrophy. Valvular disease of the heart appears to be a rare exception in calcareous pericardium, and, where present, to be very inextensive, amounting only to a nodule in one cusp of the mitral valve in Laennec's case (*op. cit.*, Case 48), and to a bead in one segment of the aortic valve, not causing insufficiency, in Ziemssen's case (*op. cit.*, *Cyclopædia of Medicine*); and in both cases the lesion may have been of independent origin.

5. The auricles in calcareous pericardium are dilated and hypertrophied—hypertrophied to compensate for their dilatation from over-distension by accumulation of blood in them, in consequence of impeded circulation through the ventricles.

6. That calcareous pericardium is not of rheumatic origin.—*Brit. Med. Journ.*, Nov. 12, 1881.

Drainage of the Pericardium.

A case, probably unique in the annals of paracentesis, has been recorded by Rosenstein, of Leyden. A child, aged ten years, suffering from pericardial effusion, presented such a degree of interference with circulation and respiration, that an aspirator needle was passed into the fourth intercostal space near the sternum, and 620 cubic centimetres of liquid were withdrawn. Left-sided pleural effusion soon followed, and 1100 cubic centimetres of liquid were evacuated. The

cardiac symptoms increased, and necessitated a second puncture of the pericardium; 120 cubic centimetres of purulent liquid were withdrawn. A relapse occurring, a larger opening was made (an inch and a half long) in the fourth intercostal space. The soft parts were divided layer by layer under strict antiseptic precautions. When the pericardial cavity was reached, a large quantity of pus escaped. Two drainage-tubes were inserted. The operation was followed by an immediate return of the circulation and respiration to normal conditions. An incision into the pleura, however, also became necessary. At the end of four months of treatment the patient left the hospital in good condition. There was no pyrexia or œdema of the skin in the præcordial region to indicate the purulent nature of the effusion —*Lancet*, Oct. 15, 1881.

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Spontaneous Rupture of the Stomach.

CHIARI and LANTSCHNER each report a case of this kind. Chiari's case concerned a fifty-three year old woman, who died a few hours after admission into the hospital, the symptoms consisting only of several attacks of vomiting and of intense pain in the belly. On post-mortem examination the curvature of the greatly dilated stomach was found very much shortened by numerous cicatrices, the pylorus being thereby sharply bent on itself, although still permeable. A longitudinal rupture was present in the most extensive cicatrix, extending 3 ctm. on either side beyond the limits of the latter. The laceration involved the mucous membrane, the muscular strata, the peritoneum in the region of the scar, and also the dense adhesions which had formed between the peritoneal surface of the stomach and the peritoneum of the omentum, which had constituted the floor of the ulcer. There were also two smaller lacerations in the vicinity, affecting only the mucous membrane. The margins of the rents were free from any signs of peptic erosion, so that Chiari concludes that the case was, in part, at least, one of spontaneous gastrorrhexis. A very extensive subperitoneal, mediastinal, and subcutaneous emphysema gradually developed after death. Lantschner's patient was a lady, seventy years of age, who had been affected for forty-five years with an umbilical hernia, which had attained the size of a large gourd. After having taken a walk she complained of great thirst, and subsequently had nausea and vomiting. While retching, the patient and those at the bedside heard a loud report, which was succeeded by collapse, death setting in about thirteen hours later. On post-mortem, the hernial sac, consisting of peritoneum, was found to contain the small intestines, with the pyloric end of the stomach, the coils of the former being partly matted together by adhesions, partly constricted by bands of adventitious connective tissue running from the intestine and mesentery to the thickened hernial sac. Along the posterior wall of the stomach, involving all the coats of the organ, there was a rent several centimetres long, through which particles of food had passed into the peritoneal cavity. In other respects the walls of the stomach were perfectly healthy.—*Med. Record*, Nov. 25, from *Allgemeine Med. Central-Zeitung*, July 27, 1881.

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The Benzoates in Dysentery.

Mr. GEO. HARRIS, officiating civil surgeon, of Burrisaul, brings to the notice of the editor of the *India Med. Gaz.*, Aug. 1, 1881, and that of the profession generally in India, the great value in the treatment of dysentery, both the acute and subacute varieties, of the benzoates of ammonia and soda, in doses of ten to twenty grains, twice, three times, or more frequently, daily. He generally uses fifteen grains three or four times daily, and prefers the salt of ammonium. He finds that it rapidly causes an active secretion of bile from the liver and cessation

of the acute symptoms. He has used it a good deal in the gaol and in private practice, and has had very good reason to be satisfied with the results. The experiments being at present only tentative, the exact dose and time of administration cannot be exactly fixed. Further experiments and practice will decide if larger doses may be better. In most cases patients tolerate the drug readily, and under its use the stools rapidly become fecal. He suggests that the excess of bile poured out into the intestine acts beneficially on the congested or even ulcerated large intestine.—*London Med. Record*, Nov. 15, 1881.

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Abscess of the Pancreas with large Lumbricus obstructing the Pancreatic Duct.

Dr. JOHN SHEA reports in the *Lancet* for Nov. 5th, the case of a woman aged twenty-nine, who was admitted to the Royal Berkshire Hospital on May 17th, complaining of abdominal pain and jaundice. After a few days' treatment with alkalies, she improved, but on June 3d, she stated she was not so well, and had had no sleep during the night; pain had returned over the gall-bladder, and there was nausea. In the evening there were pain and sickness, with vomiting of dark bilious matter. The patient was again distinctly jaundiced. She was treated by sinapisms and effervescing medicine. The bowels were freely opened, but the sickness continued. She was worse during the night, the breathing gradually got short and difficult, and at five o'clock on the morning of the 4th she lapsed into unconsciousness. Sinapisms were applied, and beef-tea and brandy enemata were administered. She remained all day with feeble pulse in the same condition, and died without rallying next day at noon.

Necropsy.—The body was fairly nourished and distinctly jaundiced. The lungs were slightly congested at the base. Liver large, pale, and soft. Pancreas enlarged and hard, being the seat of an abscess containing pus. A round worm seven inches long was found folded upon itself, lying in and obstructing the pancreatic duct, the larger portion of the worm being in the duodenum. The intestines were healthy. No other worms were present, and none were known to have been passed previously. Heart somewhat large and fatty. Kidneys pale. —*Lancet*, Nov. 5, 1881.

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Valerian and Zinc in Diabetes Insipidus.

Dr. RICHARD H. PRIOR reports in the *Lancet* for Oct. 15, 1881, a case of diabetes insipidus cured by tincture of valerian and valerianate of zinc, the latter being given in pill form and gradually increased from two grains up to twelve three times daily, and the ammoniated tincture of valerian from one drachm up to two and a half three times daily.

SURGERY.

Electrolytic Treatment of Malignant Tumours.

Prof. SEMMOLA, of the University of Naples, has been investigating the electrolytic treatment of malignant tumours. His experience was gained in the treatment of six cases—one of epithelioma of the right breast, the size of an orange; a fibro-sarcoma of the right breast; two cases of sarcoma of the right breast; one case of sarcoma of the left breast; and one cysto-sarcomatous tumour, growing from the upper third of the arm. In five of these cases amputation of the diseased part had been recommended by experienced surgeons, and the sixth was a case of recurrence eighteen months after the removal of the primary sarcomatous tumour.

The tumours are said to have had all the clinical characters of malignant growths, and to have been examined microscopically by Professor Petrone. The needles employed were the steel needles in common use for electrolytic purposes, and they were passed deeply into the tumour, converging towards its centre. In his earlier experiments only the negative pole was thus inserted, the positive pole being placed on the chest, but in the later ones he found it beneficial to pass in both poles of the battery. The batteries used were Stöhrer's and Onimus's; with the former the deviation of the galvanometer was 90°; with the latter 60° to 75°. In small tumours one inserted needle was found sufficient; but Dr. Semmola believes that he has obtained a more settled action. As a rule, passing the needles causes next to no pain or difficulty, but at times small sclerotic foci interfere with their transit. Very rarely did any painful inflammation attack the spots of puncture. The constant current should be used frequently, even three times in the twenty-four hours, and allowed to flow through the new growth for an hour each time. A weak current, long-continued, seemed to be better in its effects than a stronger current acting only for a short interval, and it is stated that the former has a greater modifying effect upon the local chemistry of nutrition. While the current is passing the galvanometer oscillates between 10° and 15°. This shows that there is some modification in the resistance offered by the tissues, and is a mark of the change produced by the current. In one case the treatment was ended in twenty-four sittings, but in another it extended over seven months. In the case of cystic sarcoma, after two applications of electricity, inflammation and destructive suppuration set in. In none of the cases were the lymphatic glands affected. Dr. Semmola suggest that electrolysis cures malignant tumours in one of three ways: by producing small foci of inflammation with consecutive sclerosis, the tumour being converted into a small, indurated and harmless lump; by producing a colloid and fatty degeneration, especially in tumours with this tendency; and by exciting destructive inflammation and suppuration of the tumour. Along with this local treatment in all his cases Dr. Semmola has combined the administration of large doses of iodide of potassium, with the view of gravely modifying the general nutrition.—*Lancet*, Nov. 26, 1881.

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A Remarkable Wound of the Brain.

An instance of singular tolerance of a severe wound of the brain was recently communicated by M. Dubrisay to the Société de Médecine de Paris. A man, aged forty-four, in an attempt at suicide, sent a small dagger through his skull into the brain. The weapon was ten centimetres long and one wide. He had held the dagger in his left hand, and given it with the right several blows with a mallet, believing that he would fall dead at the first blow. To his profound surprise he felt no pain, and observed no particular phenomenon. He struck the dagger, in all, about a dozen times. The man was a drunkard, but was sober at the moment of the attempt. When seen, about two hours latter, the handle of the dagger was projecting from the skull at the junction of the posterior and middle third, a little to the right of the middle line, and in a transverse position. The whole blade was embedded except a part one centimetre in length. For half an hour unsuccessful attempts were made to get the dagger out. The patient was placed on the ground, two vigorous persons fixed his shoulders, and aided by a strong pair of carpenter's pincers, repeated attempts were made, but without success. The patient and assistants were raised off the ground, but the dagger was immovable. These attempts caused no pain. More powerful mechanical instruments were then employed. The patient, who walked well, and complained of no headache, was taken to a coppersmith's, and by strong pincers the handle of

the dagger was fastened to a chain, which was passed over a cylinder turned by steam power. The pincers, used for drawing out tubes of copper, were so made that the more they were pulled the tighter they grasped. The man was then fastened to rings fixed in the ground, and the cylinder was gently set in motion. At the second turn the dagger came out. The blade measured ten centimetres in length, of which nine had entered the interior of the skull. The patient, who had submitted with the greatest coolness to these manœuvres, suffered no pain or inconvenience. Some drops of blood escaped, and a few minutes afterwards the man was able to walk away to a hospital, where he remained in bed for ten days, but without fever or pain. He then returned to his work, and the wound gradually healed. M. Dubrisay endeavoured by a post-mortem experiment to ascertain what parts of the brain had been injured. He drove the dagger into the head of a cadaver in the same situation, and to the same depth, and found that, without injuring the superior longitudinal sinus, it had passed into the cerebral substance just behind the ascending parietal convolution, and thus behind the motor zone; the point had not reached the base. The difficulty in extraction had been due solely to the fixation of the instrument by the edges of the wound in the bone.—*Lancet*, Nov. 12, 1881.

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Salivary Colic: Expulsion of Two Salivary Calculi.

Dr. R. SAINT PHILLIPPE reports in the *Journ. de Méd. de Bordeaux*, Août 7, 1881, the case of a man who was believed to have an abscess of one of the salivary glands: there was great pain in the maxillary, cervical, and temporal regions of the left side, with diffuse swelling under the jaw and on the floor of the buccal cavity. At the same time the masseter muscles were in a condition of contracture, preventing complete opening of the mouth. Digital exploration revealed the existence of a pocket on the left side of the frænum in the course of Wharton's duct: incision of this tumour was only followed by the escape of blood and saliva, but it produced considerable relief. Several hours afterwards the patient drew from his mouth two salivary calculi, about the size of a bean and pea. All the symptoms then disappeared, and exploration of the duct by means of a probe passed through the wound showed that no other calculus was present.—*L'Union Médicale*, Oct. 25, 1881.

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Two Cases of Malignant Stricture of the Œsophagus in which Gastrostomy was Performed.

At a meeting of the Clinical Society of London, on Oct. 28th, Mr. REEVES contributed a paper with the above title. After narrating the two cases, he pointed out how, having done gastrostomy in deference to the wishes of his colleagues, he should proceed to act in any suitable case of stricture of the œsophagus. He said that the most recent information showed that malignant obstruction was most common in the upper part of the tube, occurring in that situation in about half the cases; and, although a much larger number of observations was needed to arrive at a correct conclusion, still there was sufficient justification for the rules he wished to lay down, which were the following: 1. Because of the great mortality after gastrostomy, and also because of the more frequent occurrence of malignant stricture in the upper portion of the tube, œsophagostomy was by far the preferable operation. 2. Even in cases where the stricture was situated as low down as the manubrium sterni (its depth rarely being very great), œsophagostomy was indicated as a preliminary or exploratory operation; and, if it were found that the little finger or sound could not be passed through the narrowing, gastrostomy might then be performed. 3. If it resulted

that the opening in the œsophagus had been made below the stricture (as in most cases would be desired), the operation could be completed by stitching the mucous membrane to the edges of the wound, and the stricture might, if thought proper, be dilated through the opening either at the time of opening or subsequently. 4. If the diseased œsophagus were reached, and no opening into it could be made through healthy walls, then it might be carefully performed either by the finger or the thermo-cautery. 5. Œsophagotomy had been many times done, œsophagostomy several, and never had these operations caused any grave local or general symptoms, or, as operations, led to the death of the patient; where gastrostomy had proved most fatal. 6. The operation should be done on the left side of the neck, and a sound, if possible, be passed, that of Vacca-Berlinghieri being the best. The skin-incision should be rather the mid-line than that for ligature of the common carotid, and should extend from half an inch above the episternal notch to the level of the upper border of the thyroid cartilage. The surgeon should stand on the left of the patient, looking obliquely down and across his or her body. A tube with a funnel-shaped end should be passed, tied in place, and nourishment administered as soon as the tendency to vomit caused by the anæsthetic had passed off. It was necessary to make the opening in the walls with a sharpish stab, to prevent the loose mucous membrane being pushed before the knife. The edges of the wound might be stitched up, care being taken that no food entered. 7. The operation should be undertaken before the patient's strength was much exhausted, and even before obstruction was complete, because frequently attempts to swallow produced spasmodic suffocative dyspnœa, as in the first case related. 8. In severe cases of simple fibrous or syphilitic stricture in the tracheal or upper thoracic portion of the tube, œsophagostomy was indicated, as then the operation might be curative as well as palliative.—*Med. Times and Gazette*, Nov. 12, 1881.

Mr. GOLDING-BIRD began the discussion by giving abstracts of five cases of cancer of the œsophagus, in four of which he had performed gastrostomy. His cases showed that the chances of giving relief were inversely as the length of time the patient had suffered. One man had lived for five months after gastrostomy; he was sixty-six years of age, but his symptoms (dysphagia) had only existed for two months. All the other cases had much longer histories. Peritonitis had only been encountered once, and was then due to an accident in feeding, not likely often to recur. He advocated early recourse to gastrostomy, before the patient's digestive and recuperative powers generally were enfeebled by the malady. The operation should be done with all the cautions which Verneuil and Howse had introduced into the procedure, and which included the stitching of the wall of the stomach to the abdominal opening by two circles of sutures about an inch apart, and the deferring of the opening of the stomach for about four or five days after such stitching. In Mr. Golding-Bird's experience, in that of Dr. Goodhart, and of Mr. Lister, the cancer was usually situated at the lower part of the œsophagus, and even if it could be felt high up, one could not be sure how far it extended below; so that Mr. Golding-Bird considered gastrostomy with precautions at an early stage of the disease far preferable to œsophagotomy.

Mr. DURHAM offered a third suggestion for treatment, viz., the feeding of the patient through an elastic catheter passed into the stomach from the mouth, and allowed to remain there for about four or five days, until, in fact, it was necessary to remove it and introduce another. This alternative plan of treatment he had adopted in several cases with happy results. In one case a No. 7 catheter could only at first be passed, whereas after four months the patient was wearing a No. 12 catheter. Dr. Krishaber, at the recent International Medical Congress, had

advocated the passage of the catheter through the nostril; the policy of this modification was combated by Mr. Durham as being more disagreeable than the wearing of a "nice little pipe in the mouth." He thought that if feeding through a tube could be accomplished, it should certainly be attempted before either œsophagotomy or gastrostomy was performed.

Dr. DOUGLASS POWELL warned the users of the catheter against the dangers of the passage of the instrument from ulceration, elsewhere than into the stomach; but Dr. Andrew Clark and the surgeons who subsequently spoke, almost all advocated the use of the catheter as long as possible. And this would seem to be the outcome of the discussion: that the catheter should be used where at all possible, and that for several reasons; first, to feed the patient; secondly, to dilate the stricture; and, thirdly, to arrest the growth of the cancer, as often happens when its surface is no longer irritated by the constant passage of food across it. When the catheter can no longer be passed, the alternative lies between œsophagotomy and gastrostomy; and of these, the latter operation would appear to be held at present in somewhat the better repute. But, whichever procedure is determined upon, its performance should not be deferred; it should be done whilst the patient has yet in him the strength which may enable him to undergo and recover from the operation.—*British Med. Journal*, Nov. 26, 1881.

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Resection of the Stomach for Cancer.

We are informed that the condition of the patient upon whom Dr. Wölfler operated for carcinoma of the pylorus, exactly half a year since, is in every way satisfactory, no sign of relapse having appeared. It is the fourth case in Dr. Wölfler's book, "Ueber die Resektion des carcinomatösen Pylorus." This book, we may mention, has already been translated into Russian and Italian, and is about to appear in an English dress, so great is the interest everywhere taken in this important operative procedure inaugurated in Billroth's clinic.—*Med. Times and Gazette*, Nov. 19, 1881, from *Wien. Med. Woch.*, October 15.

Prof. BILLROTH attributes the failures which have followed his methods of partial excision of the stomach to the collection of the food in the dilated fundus. He, therefore, modified his operation by establishing a direct communication between the distended fundus and the duodenum; the only instance, however, in which this operation was performed was not very encouraging. The patient vomited continuously, the ejecta being principally bile, and death occurred on the tenth day.

The fatal result is attributed by Prof. Billroth to the fact that the contents of the stomach instead of passing down the small intestine, regurgitated through the knuckle of duodenum between the junction of the gut and stomach. He thinks this result can be avoided by the insertion of a valve to prevent this regurgitation. —*Allgemeine Wiener Med. Zeitung*, Oct. 25, 1881.

The frequency with which resection of the cancerous pylorus has been performed during the last year, particularly in Germany, raises the question as to whether in it we have really an operation which may seriously modify the prognosis in such cases. M. MAUNOURY has recently published an analysis of seven cases performed during the last year; 3 by Billroth, 1 by Rydygier, 1 by Wolfler, 1 by Czerny, and 1 by Bardenheuner, and gives the following *résumé* as to the *technique* of the different operators.

When it is intended to practise resection of the stomach, an examination, according to Wolfler, should first be made while the patient is anæsthetized, in order to thoroughly appreciate the volume, mobility, and adherences of the

tumour. For several days preceding the operation, nutritive injections of peptone are administered, and on the day before and two hours before the operation, the stomach is washed out several times. It is needless to say that all antiseptic precautions are observed.

The incision of the abdominal walls may be made in the linea alba (Péan), parallel to the linea alba and a little to the right (Rydygier), or transversely where the tumour is most prominent (Billroth, Wolfler). The peritoneum once opened, the tumour is reached, and it is at once decided whether the operation must be abandoned, as when the cancer has invaded the pancreas, the descending portion of the duodenum, or the liver. The operation may be completed, though with great difficulty, when the cancer has invaded the transverse colon or the abdominal wall. If it is found that the tumour can be removed, the adherences are broken up and the tumour separated from the great and lesser omentum throughout its entire extent; if any of the glands are infiltrated, these are removed at the same time. This being done, Rydygier places his compressors on the stomach and duodenum, at the boundaries of the tumour, which is then removed by division of the intestinal walls near the compressors. Billroth, on the other hand, does not employ compressors, which he regards as useless, if the stomach has been well washed out before the operation, and if one takes care to pass a cloth under the stomach during the incision of that organ.

The tumour being removed, there now remain two unequal openings. Rydygier diminishes the size of the opening in the stomach by cutting out a triangle in the greater curvature and sewing together the edges of the notch thus made. Billroth simply passes sutures through the gastric wall until the opening left is the same size as that of the intestine. Wehr advises, not the contraction of the orifice of the stomach, but the enlargement of that of the duodenum by an oblique or angular incision through this portion of the intestine.

Finally the stomach is reunited with the duodenum by a double row of stitches, one passing through the mucous membrane, the other through the muscular and serous coats. Either catgut (Rydygier) or carbolized silk (Billroth) may be used for the sutures. Wehr attaches great importance to the manner of placing the sutures, as does also Billroth, who further takes the precaution, before closing the abdomen, of going over each suture to see that it is firm. The abdominal wound is then closed as in other laparotomies, and dressed after the antiseptic methods. For the first few days the patient takes only ice by the mouth and is fed by injections of peptone and wine.

It is needless to say that this operation is attended by considerable danger, but it appears that peritonitis is not the most frequent complication; death occurs most often from collapse. Hemorrhage, also, above all when secondary, is a complication much to be feared; Billroth advises the ligature of all vessels before they are divided.

If now we pass to the consideration of the results of these cases in which the patients recovered from the operations, as regards permanent success, we find that Billroth's patient died of general cancer of the peritoneum four months after the operation, while in the cases of Czerny and Wolfler too little time has elapsed to enable any opinion to be formed as to the utility of intervention.—*Le Progrès Médical*, Nov. 26, 1881.

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Operative Fixation of Movable Kidneys.

HAHN has detailed in the *Centralblatt für Chirurgie*, July 23, 1881, a new operation as a substitute for nephrectomy, in cases where this would be indicated simply by reason of excessive mobility of the kidney. The operation, which has been performed on two patients, may be briefly described as follows: The patient

having been placed on the side opposite to that of the affected organ, an incision was carried along the outer border of the corresponding sacrolumbalis muscle from the lower border of the twelfth rib to the crest of the ilium, successively dividing the skin, the latissimus dorsi, and the external layer of fascia enveloping the sacrolumbalis. The last named was then drawn toward the median line, after which the quadratus lumborum muscle and the fibrous layer of the peritoneum were incised. It may be remembered here that, according to Arnold, the kidney is not entirely extraperitoneal, the anterior surface of the viscus being covered by the serous layer, and the posterior surface by the fibrous layer of the peritoneum, so that an incision through the latter does not necessarily involve an opening into the peritoneal cavity. Pressure was now exerted upon the anterior surface of the belly, so as to force the kidney into the wound, to which it was there attached by eight or ten catgut sutures, after which the whole wound was plugged with carbolized gauze. There being no reaction, the first dressing was only removed on the fifth day, the subsequent ones at corresponding intervals. In about four weeks the wounds were almost entirely healed, and the kidneys were found firmly fixed in their new location. In both cases, however, a slight degree of mobility could still be detected at a somewhat later period. It would seem advisable, therefore, in future operations to partially strip off the adipose capsule from the posterior surface of the kidney and then to stitch this part of the capsule into the wound; it would also be preferable to fix the kidney as low down as possible, in order to give the organ a firm support, and to prevent any tension upon the seat of fixation during the assumption of the upright posture. Experience teaches that a dislocated kidney creates no disturbance, no matter how low it is placed, so long as it is firmly secured in its new location.—*Med. Record*, Nov. 12, 1881.

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Extirpation of the Kidney.

A summary of experience with this operation in a large number of cases is given by KRONER, in a paper published in a recent number of the *Archiv für Gynäkologie;* this will therefore, doubtless, be read with interest. At the time Dr. Kroner wrote, the operation had been performed forty-one times, or rather, forty-one cases of its performance had been published. The following were the diseases for which it was done: In 8 cases, for hydronephrosis; in 1, cystic disease of doubtful origin; in 10, for malignant tumours of the kidney; in 2, cases of movable, but otherwise healthy, kidneys; in 1, the organ was removed along with a retro-peritoneal fibroma; in 1, on account of a fistulous communication between the ureter and the abdominal wall; in 1, for ureto-uterine fistula; in 1, for ureto-vaginal fistula; in 4, for renal calculus; in 2, because the presence of a stone in the kidney was suspected; in 4, for pyo-nephrosis; in 4, because of damage the result of injury; in 1, for disease, the nature of which is not clearly explained; in 1, part of the kidney was removed along with a hydatid cyst. In 21 of the cases the operation was performed by the abdominal incision, with 14 deaths; and in 20 by the lumbar incision, with 5 deaths; but in 3 other of these the result is not stated. Dr. Kroner does not think the higher mortality of the operation by abdominal incision is from any greater danger attending it, but because these cases included those in which the diagnosis was uncertain, and the abdomen was opened tentatively. As Dr. Kroner gives his authority for each case that he quotes, his paper is of much value for the purpose of reference. He also discusses the treatment of hydronephrosis by incision and drainage. He can only find five cases on record, three of which died. He comes to the conclusion that it is impossible to secure obliteration of a hydronephrotic sac. If there be

any bit of secreting tissue left, this will, when the pressure of the retained fluid is removed, go on secreting urine. Injection of the sac with iodine is fruitless. To find the orifice of the ureter and restore its patency, is so difficult as to be practically impossible.—*Med. Times and Gaz.*, Oct. 22, 1881.

In the *British Medical Journal* for Nov. 5, 1881, Mr. WALTER WHITEHEAD reports a case in which he extirpated the kidney for primary sarcomatous tumour, with fatal result. The patient was aged 46. On the right side of his abdomen a small, firm, freely movable globular tumour could be felt; its upper border was about one inch below and separate from the liver; its lower border was in a line with, and about two inches to the right of, the umbilicus. Percussion gave a dull sound, and no bowel could be detected over the tumour. It was perfectly painless. The patient had been aware of its presence for some short time, but felt no inconvenience from it. Percussion of the lumbar regions behind gave a duller sound on the right than on the left side, but no fulness could be detected on that side. The urine, which was examined at the time, was uniformly dark red, containing a considerable amount of blood intimately mixed with it. Microscopically examined it showed, besides blood-corpuscles, some large round cells with large nuclei, filling up nearly the whole of the cell. There were no renal casts seen. From these symptoms the diagnosis of tumour of the right kidney, probably of a sarcomatous nature, was made.

The rapid growth of the tumour, and the commencement of failure of the general health of the patient, made it evident that, if an operation were practicable, it should be undertaken soon. The free mobility of the tumour, the absence of peritonitis and of any evidence of secondary deposits, were strong points in favour of operative interference.

The operation was performed, under chloroform, on September 5th, 1881, after the following manner. An incision was made from an inch above the umbilicus downwards along the linea alba for about four inches, and the subjacent tissues were successively divided until the cavity of the abdomen was entered. A careful exploration of the surroundings and connections of the tumour was then made, and the correctness of the diagnosis verified. The examination further showed that the incision made was altogether inadequate, it being evident, from the size of the tumour, its deep attachments, and the large friable superficial vessels ramifying on its surface, that the greatest caution would be required to effect a successful removal; consequently a transverse incision was made from the centre of the first incision through the loin.

The omentum investing the front aspect of the tumour was divided in a longitudinal direction, principally by scratching with the finger-nail, and also by gently tearing. The ureter, next coming into view, was divided between two ligatures. The renal vessels were, notwithstanding their immense size, found with considerable difficulty; they were tied with a double silk ligature, and divided. One ligature was, in fact, imbedded in the substance of the tumour, the distance between the growth and the vena cava leaving no alternative. The kidney was then found to be attached by a firm, tough band to the diaphragm; and, when this was divided by scissors, the whole growth could be removed from the abdomen. A number of vessels required torsion and ligature during the operation, but, at its completion, no danger was apprehended from further hemorrhage. The edges of the incisions were brought together by silver sutures, a large drainage-tube was placed in the cavity previously occupied by the tumour, with the orifice protruding through the most dependent part of the wound in the loin, and the end of the ligature attached to the renal vessels was also brought through the same opening. The operation was conducted under the carbolic spray, and the

wound was dressed antiseptically after the operation, which occupied an hour and twenty minutes.

The cause of death, which ensued four days after the operation, must be regarded as somewhat obscure. The shock of the operation had never been very marked, the lowest temperature recorded after the operation being 98°. Peritonitis, though present, was of a subdued character, having produced neither marked pain nor prominent distension. The possibility of septic poisoning was not supported by any rigours or rise of temperature, nor was it indicated by signs of putrescence in the discharges. Pulmonary embolism was not confirmed by investigations specially directed to ascertain the possibility of this contingency. The loss of blood during and after the operation was certainly considerable, but not in the aggregate sufficient to account for death. The supposition of uræmic poisoning could not be entertained in the absence of suppression or coma; so that the cause of death in this case, as in some others after removal of the kidney, must for the present be left open, in the absence of evidence of a more definite character.

At the autopsy the remaining abdominal viscera were found free from secondary growths.

M. LE DENTU reports (*Journal de Médecine de Paris*, Nov. 26, 1881) a case of urinary fistula of the left groin following incision of a large hydronephrosis, in which he extirpated the kidney, and the patient recovered. The following is an abstract of the history of the case:—

In March, 1875, M. Le Dentu was called to see a man, aged 32, who was suffering from a large fluctuating tumour of the left flank and iliac fossa. A diagnosis of hydronephrosis and perinephritic abscess was made. The severe suffering of the patient led M. Le Dentu to incise the tumour at its most superficial point, and a large quantity of clear liquid mixed with blood escaped.

After a few days the urine commenced to flow abundantly from the wound. This condition persisted, and frequently caused violent inflammatory attacks, sufficiently severe to threaten life; so the extirpation of the corresponding kidney was resolved upon.

The operation was performed on April 14th. The cortex was easily removed; the kidney was degenerated at its upper portion, and converted into a pouch-like dilatation, the lower parts being normal; the hilus was immensely dilated. The healthy portion of the kidney was surrounded by a catgut ligature, and a second placed at a convenient distance above it, the organ being removed with scissors by cutting between the two ligatures, so as to leave a sort of stump of the organ. Treatment was carried on under antiseptic precautions for a few days, until the sloughs came away; the pulse was very feeble, and ranged from 120 to 145; temperature 100½° to 103½°.

The lumbar wound progressed steadily towards cicatrization, and was completely healed at the end of two months. The inguinal fistula, which had been enlarged with the galvano-cautery, suppurated profusely for a couple of weeks, but after the first day all dribbling of urine ceased.

Cure may now be said to be complete, although a drainage-tube in the fistulous track still passes a few drops of serous pus. The urinary functions are perfect, and the patient, who is a distinguished actor, was able to resume his profession in October.

The first nephrectomy made in France was performed by M. Le Fort; the operation was unsuccessful. That of M. Dentu is the first successful case in France.

Dr. T. GAILLARD THOMAS, in the *Medical News* for January 1, 1882, records a case in which he successfully extirpated the left kidney, on account of a large

fibro-cystic tumour. The patient was a female aged 21, on whom he operated for supposed ovarian tumour. One month after the operation she was fully convalescent.

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Treatment of Varicocele.

Dr. R. J. Levis recommends the excision of the redundant scrotum as a radical cure for varicocele. The excision should embrace a portion of the anterior and inferior part of the scrotum, fixing the clamp at the raphé or median line, and drawing the integument into its grasp entirely from the affected side. The effect of making the excision at the raphé is to locate in the median line the very small linear cicatrix that remains, so that eventually all disfigurement is avoided. If made, however, in any portion of the scrotum, the rugous folds of the skin conceal it so as to be not readily observable.

The incision should always reach to the most dependent part of the scrotum, so that, if inflammation with suppuration should unfortunately follow, drainage would readily take place.

Metallic ligatures, to hold the edges of the wound in close and accurate apposition, may be placed in position before the excision is made, but it is as well to insert them after the section is completed and the guide removed; but they must always be introduced while the clamp remains in position. Interrupted sutures are inserted very near together, and, with a view to close apposition and to insure against hemorrhage, they should be not more than a quarter of an inch apart.

Dr. Levis has not seen hemorrhage follow the operation in any case. In one case there was considerable effusion of blood into the connective tissue of the scrotum, and the healing was thereby rendered more protracted.

The plan of dressing the wound is simply to cover the scrotum with a piece of lint saturated with carbolized oil or cerate of a five percentum strength. This is held in position by the ordinary pelvic and perineal bandage, the bandage being somewhat tightly applied to prevent hemorrhage, and to avoid œdematous swelling of the loose connective tissue of the scrotum. In the daily after-dressings the carbolized oil or cerate is continued, and is held in place most conveniently by an ordinary scrotal suspensory bag.—*Phila. Med. Times*, Nov. 5, 1881.

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A New Method of Detecting Small Stones in the Bladder.

Dr. S. Cuthbertson Duncan has used for about three years the following method of detecting stone when small or in fragments. He takes a nickel-plated sound, such as is commonly used for that purpose, and holds it over the flame of an ordinary lamp or candle until the point is covered with a thin black film. After it has become quite cool, it is dipped in a solution of collodion and allowed to dry. He then oils it with castor-oil, and introduces it a short distance in the urethra and withdraws it, to see if it be injured. If not, he proceeds to explore the floor of the bladder with a sweeping lateral movement. If there be a stone or any fragments left after lithotrity, its black covering will be removed in patches, and the bright metal will show through. The author thinks this more delicate than Mr. Napier's indicator, the point of which is made of lead, blackened by chemical agents; and this very method does not impair the conducting power of the sound in any degree. A short beaked solid steel sound is preferred, with a round handle, which has a flat disk about two inches from the end, at right angles to the curve of the beak, to serve as a guide for the direction of the point. The round handle allows it to be rotated between the index-finger and thumb, the

most sensitive part of the hand—two things necessary for rapid and delicate manipulation.—*Brit. Med. Journ.*, Nov. 12, 1881.

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A Case of Imperforate Anus with Absence of Rectum.

Mr. G. S. ROBERTSON, of the Indian Medical Service, reports a case of a male child which was brought to the dispensary at Kheri. There was no anus nor any bulging in that region; genital organs were developed; abdomen distended, and its superficial veins prominent and congested; child very restless, and had at noon vomited fecal matter.

An incision was made where the anus should have been, and the rectum sought far as far as prudence would allow. No trace of the bowel being found, this operation was abandoned, and the descending colon laid open in the left loin by an oblique incision: no difficulties were met with. From the 10th to the 15th day after the operation some trouble was caused by prolapse of the bowel, and on the 12th day the protruded gut was much swollen and congested. The child's crying preventing its reduction, chloroform was administered, when it was put back easily enough.

On the 11th and 12th days there was some fever and restlessness, and the child refused the breast.

On the 9th of March the wound had healed up, and by its contraction prevented any protrusion of the bowel on straining or on crying. On this date the case was discharged from hospital.

A fortnight ago, five months after the operation, the child was brought for inspection. He had grown very much, and was in every respect a fine healthy infant. The artificial anus was not contracted, nor was there any trouble from prolapse of the intestine; the case was in every way successful.

This case is of interest because the best position for opening the bowel in the abdomen after failure of the ano-perineal incision may be said to be still *sub judice*.

On this point: the facility with which the loin operation can be performed, the certainty of getting hold of that part of the intestine you want, and the comparative smallness of the risk, seem to indicate it as the right procedure; but it has to be added, that statistics are against it.

Another point of interest is that the child was five days old when brought to the dispensary; that the abdomen was greatly distended, and that fecal vomiting had occurred.—*Indian Medical Gazette*, Sept 1, 1881.

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A Successful Case of Simultaneous Ligature of the Subclavian and Carotid Arteries for Innominate Aneurism.

At the meeting of the Royal Medical and Chirurgical Society of London, Mr. H. W. LANGLEY BROWNE reported the following case:—

Suffering from the above disease in an advanced form, John A., aged thirty-two, was admitted into the West Bromwich Hospital on June 29th, 1881. The sac walls and coverings were thin and liable to rupture. There was a loud bruit over the swelling. The man was very weak, and suffered intense pain in the chest. On July 11th, 1881, the two arteries were tied with chromic catgut ligature, which Professor Lister had himself prepared. Antiseptic measures were used throughout. The highest temperature was 100.6°. Pulsation returned in the right temporal four days, and in the right radial nine days after ligature, and is even yet very slight at the radial. There is much less pulsation in the tumour, which has strong thick walls. There is no bruit or pain. The man feels so well,

that he has already tried to work. The condition of the tumour on Oct. 28th is still one of improvement.

Mr. BARWELL congratulated the author on the great success of his case, and inquired as to the condition of the rest of the aorta and the heart, as the success or not of operations in such cases depends much on this. There are now on record 28 cases of double deligation, or rather 27 exclusively of Hobart's and Rossi's —of these 9 died within fifteen days; 7 lived various periods under six months, the shortest time being two months and a half; 9 have lived over a year; shortest, fourteen months; and longest (Heath), seven years and seventeen days. Most of the cases which have died have been examined after death, and in the first category are 3 cases which died from troubles due to the ligature; in one from secondary hemorrhage, another from exhaustion, and the third from ether administration. Of the second category, those who died earliest had extensive atheroma of the aorta; one living fourteen months had a second aneurism of the descending aorta. Three cases were still living—viz., Stevenson's, Wyeth's, and Langley Browne's. On these data some conclusions may be come to as to the contra-indications for operation. Dilated aorta caused death from suppuration of the sac or its rupture, or exhaustion, which really meant disordered circulation. Tying two such vessels close to the aorta must tend to considerable increase of tension in the rest of the aorta. When the aorta is already dilated as well as atheromatous, the double distal deligation may be followed by rapid death; when atheromatous and not dilated, other disturbances of circulation ensue. When also a large aneurism involves the first and second divisions of the aorta, the heart is hypertrophied, and there is also generally aortic incompetence. Before operating the absence of such cardiac and aortic conditions should be determined.

Mr. HOLMES thought it almost a pity to publish these cases so early; it is very difficult to see how much benefit depends on the result of distal deligation, and how much on rest in bed. The danger of rupture which appeared imminent may have passed away, but it was a misnomer to call it a "successful" case. If it was meant by "successful" that the aneurism is cured, and there is no danger of its growing again, there is no proof in this record, only a marked improvement. He was not aware that any surgeon operated in any such case knowingly in presence of heart and aortic diseases. If there be cardiac hypertrophy or aortic disease, he is rash who would then operate. The difficulty is to know when the aorta is dilated and atheromatous; there are very few cases in which they are not so, but the signs are not certain. Mr. Holmes doubted very much whether Hobart ever tied the subclavian; it would have been very remarkable if there had been any anatomical evidence that the first part of the subclavian had been tied, but this evidence was wanting, the part being destroyed by the post-mortem. Rossi's case is variously related. In commencing this operation one should not indulge in too sanguine expectations. He had never seen a case actually cured —*i. e.*, delivered from the disease—although he had seen much benefit derived in many cases.

Mr. HEATH agreed with Mr. Holmes as to the difficulty in diagnosing an aneurism of the innominate from one of the aorta; in this case, eighteen years ago, it turned out to be aortic. In most of the cases in Whyte's tables the aneurism was of innominate and aorta, and in some of aorta alone; there was really no positive test, and it is a pity that the case should be brought forward so early. There is a preparation which shows such aneurism perfectly cured. If it be right that no operation should be done in presence of atheroma, as Mr. Barwell had said, how could he justify his operation of double ligature in aortic aneurism, and yet in some of these cases life had been prolonged.

Mr. Barwell said he had stated "extensively" atheromatous as a contra-indication.

Mr. Heath thought a large aortic aneurism must be certainly atheromatous.

Mr. Langley Browne, in reply, said, so far as he could make out, the heart was sound, but he could not speak with certainty about the aorta. He was hoping from the history that the aneurism was chiefly traumatic, and that atheroma at his age might be absent. The test of its being innominate was based on that given by Wardrop—viz., by its commencing nearer the trachea and sterno-mastoids—and it was altogether formed in six months. It is a case of successful ligature of the subclavian and carotid, in the sense that a herniotomy may be successful without at the same time radically curing the disease. So far as a cure of the disease goes, it is, of course, too early to speak. The chromic gut was used in the operation. Eight years ago he had tied the common carotid for a carotid aneurism with carbolic gut ligature, which gave way in a few days, with return of pulsation, but eventually recovery, and the patient still lives. In another case he applied the carbolic ligature to the femoral; it also gave way, and amputation had to be performed. No trace of the ligature remained. In the present case no ligature was left, but it held firmly for a longer time than the carbolized gut.—*Lancet*, Nov. 12, 1881.

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Nerve-stretching.

The surgery of the nervous system continues to form the subject of numerous communications to medical journals both at home and abroad. In No. 38 of the *Centralblatt für Chirurgie*, we find an account by Holl, of Vienna, of two methods of cutting down upon the buccal nerve and excising a portion of it, in order to relieve a neuralgia of that part of the face which it supplies. He records three cases by Michel, Schuh, and Billroth, in which the nerve was reached by an incision through the cheek along the anterior border of the masseter. The author draws attention to the fact that in this way the main trunk of the nerve cannot be reached, and that, in order to do this, it should be sought from the interior of the mouth. He gives directions for performing this operation as follows: If the mouth be widely opened, a groove is seen running near the anterior border of the internal pterygoid muscle, from the depression behind the tuberosity of the upper jaw, which portion of bone can be felt beneath the mucous membrane, to the last lower molar tooth. An incision in the line of this groove through mucous membrane and some glands leads to the nerve; it is only necessary to free it from some surrounding fat, to enable the surgeon to remove a portion of it one or two centimetres long. He adds that the feasibility, and, indeed, ease of performance, of the operation has not only been demonstrated on the dead subject, but upon the living, it having been actually performed by A. Wolfler in Billroth's clinique. Cases of neuralgia of the buccal nerve are not, we imagine, common, but if one were met with, the suggested operation seems a rational one. In the same number we find a paper by M. Benedikt, recounting three cases of stretching of the great sciatic nerve for locomotor ataxy, and one of the facial in a case of long-standing paralysis with secondary *tic spasmodique*. The ataxic cases were all remarkably improved, not only as regards the pains and other disturbances of sensation, but also in respect of the ataxy, paralysis of the bladder, and even amblyopia. It is mortifying to observe that the effect of this operation appears to vary so widely in different cases. Those which we have ourselves seen have not yielded such brilliant results as seem to be frequently obtained by our German brethren. Is it possible that we are not in the habit of doing the actual stretching vigorously enough in this country? or is it

that cases differ very much in their amenability to treatment in this way? The facial case seems to have presented considerable difficulty from the fact of the nerve being much degenerated and embedded in cicatricial tissue. The operation was, however, successfully carried out, with relief to the *tic*, and also, strange to say, a rapid improvement of the paralysis. This result is doubly remarkable, as, in all cases we have seen or read of, a very prolonged paralysis of the muscles supplied was the immediate result of the stretching. No doubt there is much still to be learned, both as to the *modus operandi* of nerve-stretching and as to the classes of cases in which it is likely to prove beneficial.—*Med. Times and Gazette*, Nov. 12, 1881.

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Stretching of the Lingual Nerve for Facial Neuralgia.

At the meeting of the *Societé de Chirurgie* on Nov. 2, M. Le Dentu presented a patient in whom he had successfully practised stretching of the lingual nerve for neuralgia of the face with epileptiform convulsions. The pain was located in the temporal region, auricle, lower jaw, and the left side of the tongue; it had lasted for five years, but in the last few months had so increased in severity as to be insupportable. It was above all in the left side of the tongue that the pain was most acute.

M. Le Dentu had practised stretching of the lingual nerve with a view of relieving the pain in the tongue, but without the least hope of any effect whatever on the other points which were the seat of the neuralgia. After having laid bare and isolated the nerve, the top of the tongue being fixed by a thread passed through it and held by an assistant, M. Le Dentu gently raised the nerve with a small hook about 12 millimetres above the mucous membrane of the mouth, and after maintaining this degree of elongation for a few moments he allowed the nerve to regain its normal position.

M. Le Dentu, in view of the long duration of the disease, did not expect any immediate result. On the second day, however, the patient was able to sleep quietly, and thirteen days after the operation the pains had entirely ceased, not only in the tongue, but also in the temporal region, only remaining in a slight degree above the angle of the jaw. He was able to sleep and eat perfectly well. He therefore may be considered as cured, at least temporarily: it remains to be seen whether his cure will be permanent or not. M. Le Dentu added that he had previously in another case practised, with success, resection of the auriculo-temporal nerve for facial neuralgia.

M. Polaillon said, that three months before he had stretched the inferior dental nerve for violent neuralgia of this nerve, and the patient has been free from pain since then.

M. Micaise drew attention to the possibility of more or less grave accident following resection of the facial nerves, particularly after operation on the trigeminal from disturbance of the ganglion of Gasser, or, as M. Tillaux remarked, atrophic ocular troubles may follow operative interference with the superior maxillary nerve.—*L'Union Médicale*, Nov. 8, 1881.

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The Diagnosis of Fracture of the Neck of the Femur.

The difficulties in the way of diagnosis of fractures of the neck of the femur when crepitus is absent, or when it is not good practice to try and find crepitus, have lead Dr. J. S. Wight to tabulate his measurements of twenty-one cases of such fractures. His points selected for measurements are:—

(1.) Inside measurements from the superior anterior spines of the ilium to the lower ends of the internal malleoli. (2.) Outside measurements from the

superior anterior spines of the ilium to the lower ends of the external malleoli. (3.) Measurements from the tops of the great trochanters to the lower ends of the external malleoli. (4.) Measurements from the bases of the tibiæ to the lower ends of the internal malleoli. (5.) Measurements from the superior anterior spines of the ilium to a line drawn transversely in front between the tops of the great trochanters. This is the *transverse femoral line.*

The object of all these comparative measurements is to determine the possibility of original asymmetry of the two limbs, and find out, as far as possible, if the injury to the hip has caused any shortening of the limb on the injured side, so that we can infer the *probability* of there being a fracture of the femoral neck.

In the cases reported it may be noted that,

(1.) In all of the twenty-one cases recorded, there was more or less obliteration of the abdomino-femoral—or inguinal—fold on the side of the injury. This was probably due to two causes: (i.) Effusion in front of the injured femoral neck; (ii.) Contraction of the soft parts in front of the femoral neck. (2.) About one-half of the patients were examined standing up; and when the foot of the injured side was brought down to the floor, the gluteo-femoral fold on that side was seen to be lower than the gluteo-femoral fold on the uninjured side. (3.) There was out-rotation of the injured limb in all but two of the cases reported. (4.) In all the cases of impaction of the base of the femoral neck, the upper end of the femoral shaft was materially enlarged. There were probably eight such cases. (5.) In all of the cases of impaction of the top of the femoral neck into the femoral head, the upper end of the femoral shaft was not enlarged. There were probably five such cases. (6.) The other eight cases could not probably belong to either of the above classes. (7.) In all of the cases there was more or less prominence of the outside of the hip, but the gluteal region was somewhat flattened; and generally there was a fusiform enlargement of the upper part of the thigh. (8.) In 14 of the 21 cases, there was more or less asymmetry of the lower limbs. And this point is important for two reasons: First, It was determined by measuring from the tops of the great trochanters. Second, it agrees with the general fact, that about two persons out of every three have asymmetry of the lower limbs: Hence, the above measurements from the tops of the great trochanters to the external malleoli were probably correct: *Hence, such a measurement may be recommended as a valuable aid in making a diagnosis of fracture of the neck of the femur.*

It may be remarked, that a fracture of the inner half of the femoral neck could be intra-capsular, that a fracture of the outer half of the femoral neck could be intra-extra-capsular, that a fracture entirely outside of the femoral capsule could not properly be a cervical fracture, and that the fracture ordinarily called *extra-capsular of the neck of the femur* would be more appropriately called a fracture of the base of femoral neck—except in a few cases where the femoral capsule is inserted so far inward on the femoral neck as to give a sufficient space to fracture the cervical bone outside of the capsule.

In some of the cases there has been impaction of the base of the neck into the trochanteric part of the femur; in others there has been impaction of the summit of the neck—the femoral brace—into the head of the femur; and in others there has been impaction of the femoral neck into both the femoral head and the trochanters. It is generally not difficult to make a diagnosis of impaction of the femoral neck into the trochanters, on account of the usual expansion or enlargement of the trochanteric region. When certain deformities are indicated by the attitude and the measurements of an injured limb—the trochanteric expansion being absent—it may be reasonably inferred that there has been an impaction of the femoral neck into the femoral head.

From his table of measurements of the twenty-one cases the following conclusions may be drawn:—

(1.) The average shortening after fracture of the neck of the femur, as shown by the inside measurement, is about $\frac{62}{100}$ of an inch; as shown by the outside measurement, is about $\frac{55}{100}$ of an inch; and as shown by both measurements, is about one-half inch, $\frac{58}{100}$.

(2.) The greatest shortening was one inch and one-half.

(3.) The least shortening was zero. *But in that case there was an actual shortening of three-fourths of an inch.*

(4.) The average normal asymmetry of the lower limbs in the above 21 cases was $\frac{48}{100}$ of an inch.

(5.) The average shortening of the measurement from the superior anterior spine of the ilium to the transverse femoral line was about one-half inch, again showing that the top of the trochanter major is an approximately accurate point from which to measure.

(6.) In the four following cases the injured limb appeared to be shortened one-fourth of an inch by a comparison of the inside measurements.

On account of the asymmetry of the lower limbs, in Case I., there was the average shortening of one-half inch; in Case VI. there was a real shortening of three-fourths of an inch, and in Case VII. of one inch and one-fourth—in fact the injured limb was longer than the uninjured limb—and in Case XII. of three-fourths of an inch. Now, it is an important practical fact, to which especial attention should be drawn, that asymmetry of the lower limbs complicated the evidence of a diagnosis in these four cases. To neglect this point and base a diagnosis on equality of the ordinary measurements of the lower limbs might bring avoidable disaster and detriment to both the patient and the attending surgeon. Hence, it is important to consider the subject of asymmetry in making a diagnosis of fracture of the neck of the femur, because a fracture of the femoral neck may thereby be shown to be probable—and proper treatment instituted—and legal prosecution be prevented.

From the above table and from subsequent measurement it appears that a lower limb will be shortened $\frac{6}{10}$ of an inch by a fracture of its femoral neck, and that during the treatment the limb will shorten about $\frac{2}{10}$ of an inch more.

From a theoretical point of view there need be no surprise that the lower limb does not materially shorten during treatment of fracture of the femoral neck, when we remember and appreciate two plain anatomical facts: First. There are strong facial structures going from the upper end of the femoral shaft obliquely downward and inward to the obturator membrane and the arch of bone below and at the sides of the obturator foramen. These structures act as strong ligaments to prevent the femoral shaft from going materially upward after fracture of the femoral neck—and they are assisted by the contractile force of the obturator externus muscle. Second. Femoral necks that are liable to be broken are probably mostly more or less nearly at a right angle with the femoral shaft. Hence, after fracture of the femoral neck, and during the treatment, the usual absorption of broken and contused bone will be nearly in a direction at right angles to the femoral shaft, so that absorption of the femoral neck would not cause material shortening of the injured limb. And there may be noted an important mechanical and pathological condition, namely, when the femoral brace is driven into the femoral head, but very little shortening can take place, so long as the impaction holds. And the mechanical relations are such that the femoral brace is not likely to be liberated from the grasp of the femoral head, unless severe and unwarranted force is employed to find crepitus.

Dr. Wight is aware that the above conclusions in regard to consecutive shortening

after fracture of the neck of the femur are not in accord with the accepted teachings of surgeons, and on this point he makes the following remarks:—

(1.) It is worthy of note that careful and systematic attempts have not been made to make comparative measurements of the length of the lower limb at the time of fracture of the femoral neck and subsequently. The teachings on this point are in the main founded on the opinions of surgeons.

(2.) The tilting of the pelvis—upward on the injured side—will make a difference of nearly one-half inch in the measurements of the lower limbs in favour of the limb whose femoral neck has been broken; *under such circumstances the surgeon makes the first measurements.* The consecutive tilting of the pelvis—downward on the injured side—will make a difference of nearly one-half inch in the measurements of the lower limbs in favour of the limb whose femoral neck has not been broken; *under such circumstances the surgeon makes the second or consecutive measurements.* In the first place, the injured limb measures comparatively too long; in the second place, the injured limb measures comparatively too short.

In no case of fracture of the femoral neck does he use force to find crepitus. He considers the other evidences of fracture—such as have been above enumerated—as sufficient to come to a practical conclusion. Nor does he give an anæsthetic to make an examination. In this connection he makes the following statements:—

(1.) Moving the outer fragment when it is in contact with the inner fragment, will generally carry the inner fragment with it, and there will be no crepitus. And when there is impaction, ordinary manipulation will not cause crepitus to be felt. Yet crepitus may at times be felt, when there is impaction of the neck of the femur.

(2.) Moving the outer fragment when it is not in contact with the inner fragment, of course will not give crepitus.

(3.) Hence, unwarrantable force will be required in order to get crepitus in many cases of fracture of the neck of the femur. And more than this—*an impacted fracture of the neck of the femur may be broken up by severe manipulation, and a patient that would have had a useful limb may be quite completely disabled for life—for an impacted fracture of the neck of the femur is the best setting of the bony fragments that the surgeon can have.*

(4.) In a suspected case of fracture of the neck of the femur, I examine all the witnesses of fracture except crepitus, and if these witnesses agree substantially, I pronounce a verdict in favour of fracture of the neck of the femur. And if there is a doubt as to the correctness of such a verdict, I give the patient the benefit of that doubt, by treating the case as if there was a fracture of the neck of the femur—and then the surgeon receives a benefit from the doubt. But if there is no fracture, the patient has had some days of needful rest, and has had a contused hip well treated.—*Proceedings of the Medical Society of Kings County*, Oct. 1881.

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Excision of Callus.

In the number of the *Archives Générales* for August, 1881, Dr. DÉLEUS records a very interesting case of fracture of the left clavicle in a man, forty-two years of age, who at the same time received a fracture of two ribs on the left side, which so complicated the case that no proper apparatus could be applied to the clavicle. The fracture was in the usual seat, in the greatest convexity, and was attended with considerable displacement of the ends of the bone. Around these ends a large mass of callus developed, which two and a half months from the injury measured five centimetres from before backwards. This callus pressed upon the

subclavian artery and brachial plexus of nerves, as was shown by weakening of the radial pulse, and wasting and loss of power in the whole upper extremity, with a sense of formication. By subperiosteal resection about eight centimetres of the bone and callus were removed. The radial pulse at once returned to the normal in size and force. Electrical treatment was applied to the limb and nerves in the posterior triangle, and was attended with a gradual return to power and bulk. After three months the strength of the left arm nearly equalled that of the right, but abduction and adduction of the arm were not quite so free as on the sound side. The operation is a novel one, and not lightly to be resorted to. It is well known that large masses of callus become absorbed, but in this case the displacement of the fragments seems to have been so great and entirely uncorrected by treatment that a large mass of bone was of necessity formed to unite them together. Under these circumstances, and when it was made perfectly clear that nature unaided was insufficient for the task, the operation was justifiable. It is remarkable that there were not greater signs of venous obstruction from compression of the subclavian vein.—*Lancet*, Nov. 19, 1881.

OPHTHALMOLOGY AND OTOLOGY.

Treatment of Gonorrhœal Conjunctivitis by Division of the External Commissure and Fixed Eversion of the Lower Lid.

In a severe case of this disease, in which one eye was already lost through corneal suppuration, and the other was in a state of acute inflammation, with great chemosis and swelling of the lids, and turbidity of the cornea, Dr. FUCHS proceeded as follows (*Centralb. für die Prakt. Augenheilk.*, July, 1881). The outer commissure was freely divided, so as to completely relax the eyelids; a loop of thread was passed through the lower eyelid, and brought out and fastened far down on the cheek by Gaillard's method, so as to cause complete ectropion of the lower lid; iced compresses and frequent cleansings were ordered. The cornea was perfectly clear on the fifth day; cure was effected; the incision through the commissure resulted in a fine linear cicatrix. In a second case, in which, likewise, turbidity of the cornea had already appeared, complete cure was effected by the same measures. By this proceeding, the author alleges that he obtains the advantages which Mr. Critchett has achieved by bisecting the upper eyelid, without the danger of subsequent deformity which he believes to attend the latter operation. The advantages gained are diminution of the pressure of the lids, increased ease of egress for the purulent secretion, ready access to the inner surface of the lids for cleansing purposes, and free escape of blood from the incised commissure.—*London Med. Rec.*, Nov. 15, 1881.

Effects of Dynamic Electricity on Opacities of the Vitreous Body.

In order to appreciate the therapeutic value of the more or less prolonged use of the constant current in opacities of the vitreous body, M. GIRAUD-TEULON began by first examining the different anatomical peculiarities of these alterations.

The opacities of the vitreous body result from the proliferation of its own tissue cells, and the different forms under which these opacities appear correspond to different degrees of activity of the proliferation; so we may have the hypertrophic form, or in a case of marked activity the suppurative form; or when the process is very languid changes of an atrophic nature may be produced. Many

different causes may act as the starting point of these changes. With M. Boucheron, M. Giraud-Teulon is of the opinion that, as an acute glaucoma shows us, there can exist a pronounced opacity in the vitreous body without any important change in its tissue; and that cases of rapid cure of affections of the vitreous body by the continuous current probably belong to this class, that is, they are not associated with any profound structural alteration.

In conclusion, however, M. Giraud-Teulon believes that in all instances of opacity of the vitreous body, whatever may be its degree or extent, provided it has not reached a form of marked hypertrophy, the continued constant current should be considered as the most efficacious therapeutic measure, and one which is followed by the most rapid results.—*Bull. Gén. de Therapeutique*, Nov. 15, 1881.

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Nerve-Stretching applied to Ophthalmic Surgery.

Dr. WECKER (*Klin. Monatsb. für Augenheilk.*, June, 1881) hopes that the process of nerve-stretching, introduced into general surgery with such astonishingly good results by Professor Nussbaum, may be turned to account also in ophthalmic surgery. Having studied the relations of the optic nerve in the dead subject with regard to the mode in which it may most readily be stretched, he operated on the living as follows. The lids being widely separated, the conjunctiva is divided to an extent of two centimetres in a tangent to the inner corneal margin; the subconjunctival tissue is freely separated; the tendon of the internal rectus is taken up on a hook, carefully divided, and secured by means of a suture passed through it. Tenon's capsule is separated from the globe by means of a blunt splatula as far back as the insertion of the optic nerve; then, while the cornea is rotated outwards by means of fixation forceps, the optic nerve is secured by a strong strabismus-hook, and forcibly pulled forwards towards the front of the orbit. The traction must be tolerably energetic, and must enable the operator to reach the insertion of the nerve with his finger. The hook is then withdrawn, the divided tendon is secured to the conjunctiva by the suture already introduced, and an antiseptic dressing applied. The operation has been performed as yet only on blind eyes, the object being to ascertain its influence on the nerve-centres, and the extent to which "hallucinations, pain, and so forth," can be lessened by it. The results are to be communicated later.—*London Med. Rec.*, Nov. 15, 1881.

MIDWIFERY AND GYNÆCOLOGY.

Uterine Contractions Produced by Electricity.

From a series of observations made on the subject by Dr. PAUL HELOT, the following conclusions are drawn:—

1st. The uterus, under the influence of electric currents, shows evident contractions, not only during pregnancy and immediately after parturition, but also during the non-gravid condition.

2d. These contractions can be rendered visible in certain pathological conditions, where a plug of mucus in the cervix causes the retention of the uterine secretions. During contraction this *index* can be seen to advance and again to regain its former position on the cessation of the contraction.

3d. These contractions can be produced by a Faradic current when the inter-

ruptions are very rapid, but this method is painful, and should be confined to the treatment of post-partum hemorrhage.

4th. Galvanization by the interruption of a constant current is the most favourable means of producing contractions, because it causes only slight pain, and because to the mechanical action there is added the electrolytic action of the battery.

5th. The maximum useful result is produced with a current of 25 to 30 milliwebers, rapidly interrupted each second, and only applied for a short space of time.—*Annales de Gynecologie*, Nov. 1881.

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Delivery through the Perineum.

Mr. ROBERT W. HARLEY, at a late meeting of the Dublin Obstetrical Society (*Dublin Med. Journal*, Sept. 1880), reported the case of a patient 25 years of age, of small make, whose husband complained of difficulty of having connection with her on account of a very flat and low pubic bone, to which he attributed the accident about to be described.

On Feb. 27th Mr. Harley was urgently summoned to her as labour was setting in. On examination he found the os fully dilated and the head very low down. While examining her a strong expulsive pain came on, rapidly followed by others; the rectum was distended, and the perineum rapidly thinned. All the force seemed directed backwards, and during one of these pains, and while he was endeavouring to direct the head forward, the extreme force of the uterine action meeting with the low pubic bone as a resisting force, which prevented the sweep forward, drove the head right through the perineum in its posterior third. Delivery was rapidly completed through the rent, and the placenta followed through the same opening. There was about an inch wide of perineum in front, and the laceration extended backwards till it reached the sphincter ani, but did not injure it. The parts were brought into apposition by sutures, and the perineum subsequently perfectly healed.

This accident is fortunately of very rare occurrence. Dr. Ramsbotham saw only four cases in his large experience. He calls it "Bursting through the Perineum;" in three of the cases mentioned by him it was, unlike mine, the result of long-continued labour, and rigidity of the perineum, in the other case it was due to the giving way of an old cicatrix, the result of a slough. Dr. Churchill evidently never met with this form of injury. In speaking of it he says it has been mentioned by various authors, whose names he quotes, and he adds, "a case occurred in this city." Dr. Kidd has never seen it. Dr. J. C. Reeve, of Dayton, Ohio, has recently reported a case occurring in a woman aged thirty-three, on her third delivery, and he "claims" that this is the only case on record occurring in a multipara, but he errs in that, as Dr. Ramsbotham's fourth case was on the birth of her second child, the cicatrix being the result of a slough of the vagina, after the birth of her first. He (Dr. Reeve) has collected a list of thirty-five cases of this accident, and he has ransacked all the literature of all the continents to procure them. He describes his case as one of "precipitate labour" a most appropriate designation. He says the woman was out of her bed, over the vessel, when she was taken with a violent pain, and had scarcely time to get back on the bed before the child was born. She was not aware for three days that anything was wrong. The rent began on the right side, near the junction of the upper fourth with the lower three-fourths of the labium, followed the outer boundary of the labium downwards, and crossed the perineum to the rectum; both the anal sphincters were divided, the laceration extending upwards, quite an inch and a half. The part of the perineum remaining intact at the

posterior commissure, and along the lower part of the right labium, was about the thickness of a man's thumb. Dr. Reeve subsequently employed the deep operation for the cure of this, and almost succeeded, a slight fistula only remaining, when he lost sight of the case. She had only a midwife in attendance at the labour.

Dr. Roe suggested to Mr. Harley that if he had divided the perineum at each side in the line of the labia, verging towards the centre, there would have been no such accident, and the incised wounds would have healed rapidly, being kept in apposition by the natural folding of the parts; and Dr. Harley finds that Dr. White, of Buffalo, has also recommended this course; but in the case related it was so sudden and so unexpected, and the labour was so "precipitate," Dr. Harley was quite unprepared to think of any measure for averting it. In the case reported by Ramsbotham no doubt the employment of these incisions would have prevented the accident, as the cause was rigidity; and long-continued pressure—pressure from within and without; he himself, in one case, pressing the perineum for two hours unceasingly. In Dr. Harley's opinion this pressure on the perineum is very injurious, and most productive of the result we wish to avoid, paralyzing its elasticity, and checking its circulation. He also believes that too much pressure on the head from behind forwards, especially if the pubis is flat or low, is very likely to produce this accident.

Dr. RUTHERFORD KIRKPATRICK said that while he was assistant at the Rotunda Hospital he saw two cases of laceration of this kind. One of the persons in whom it occurred was a young unmarried female only sixteen years of age. The child was completely expelled through the perineum. She died in two or three days afterwards of sloughing and puerperal fever. The other case was that of a woman, about thirty-five years of age, also unmarried; it was her first child. The head was presenting with the face towards the pubis; the perineum was distended, and a central perforation took place. The child, a very large one, was expelled through the perineum, leaving the anterior part intact, and not injuring the sphincter of the anus. The woman remained in hospital for some months, and by treatment and cleanliness the wound was healed so completely that no mark of the rupture remained. No sloughing took place. The sacrum was rather straight, and that was said to have been the cause of the laceration. In neither of these cases was any operation of stitching performed, either at the time or subsequently.

Dr. MORE-MADDEN said the accident is one of the rarest occurrences in midwifery practice. In the only case of central laceration of the perineum which he saw when he was assistant in the Rotunda, the patient was brought in with the arm of the child protruding through the perineum, midway between the fourchette and the sphincter ani. Dr. Harley has said that lacerations of this part may, in some cases, be obviated by incising the perineum bilaterally, as has been suggested by Dr. Roe. Dr. Madden should be very sorry to deprive Dr. Roe of any of the credit which is due to him for the many valuable practical suggestions for which we are indebted to his ingenuity, but at the same time he may mention, that upwards of a hundred years ago Sir Fielding Ould recommended the incision of the perineum with a pair of probe-pointed scissors, to prevent these lacerations; and he has himself, for many years, practised a somewhat similar procedure in suitable cases. But previously to that Dr. Beatty had also called attention to the prevention of lacerations by a perineal incision. Dr. Roe, however, has proved the superiority of the *bilateral* incision of the perineum for this purpose, and Dr. Harley can bear testimony to the fact that we may very often succeed in preventing these lacerations by making an incision at right angles to the threatened rent.

Rupture of the Uterus successfully treated by Drainage.

Two cases in which this usually fatal accident was successfully treated by drainage, are reported in a recent number of the *Centralblatt für Gynäkologie* (1880, No. 26). One is reported by Dr. MORSBACH. The patient was aged thirty-five, and had had four children, the last five years previously. Labour came on at full term. When vigorous pains had lasted five hours, the midwife ruptured the membranes. After this, the patient, who had till then been standing, felt herself obliged to lie down; and the pains ceased. Three powders, obtained from a chemist, were given to bring on pains, without effect. Ten hours after the rupture of the membranes, Dr. Morsbach saw the patient. The os uteri was about eight centimetres in diameter, and the feet could be felt presenting, but high up. A dose of ergot was given, without effect. The patient was then narcotized, and it was discovered that there was a rupture of the vagina and cervix uteri, and that the child was in the abdominal cavity, except one foot, which was within the uterus. The foot was seized, and the rent carefully enlarged by numerous small incisions with scissors, till it would allow the child to be extracted. The hand was then inserted, and the placenta, which was in the peritoneal cavity, was removed. Two thick caoutchouc drainage-tubes were put into the rent, and a pad of salicylated wool between the thighs. Slight pyrexia followed, lasting a little more than a week, with abdominal tenderness and tympanites. One drainage-tube was removed the next day, and the other on the fourth day. The patient got up on the fourteenth day. Fourteen weeks afterwards she thought herself quite well. There was then a deep fissure in the cervix posteriorly, the bottom of which could not be reached by the finger, and a cicatrix in the posterior vaginal wall. Dr. Morsbach thought it possible that the midwife may have ruptured the uterus when she thought she was only rupturing the membranes, for she admitted that she had found great difficulty in doing what she did. The other case occurred in Berlin, and is reported by Dr. M. GRAEFE. The patient was in labour with her thirteenth child. The pains continued for six hours, and then suddenly ceased. An hour afterwards she was found in a state of collapse, the face presenting, an arm down in front, and a foot behind. Incomplete rupture of the uterus was diagnosed, and the patient was removed to the hospital. When she got there it was plain that the child was in the abdominal cavity, the contracted uterus being felt in front and to the left of it. The hand was introduced, a foot seized, and the child extracted; then the placenta was removed. The uterus was found ruptured transversely, only about three fingers' breadth of its wall remaining entire. The peritoneal cavity contained much clotted blood and meconium. It was washed out with a 2½ per cent. carbolic acid solution, and then a thick drainage tube, thirty centimetres long, put into the abdominal cavity, and secured by a silk suture to the posterior commissure. A bandage was put round the abdomen, and on it an ice-bladder. During the first two days the pulse was hardly perceptible. Hiccough and vomiting were troublesome during the first five days. The temperature did not rise till after the sixth day, when she began to have evening exacerbations of fever, which continued until the beginning of the fourth week, after which the temperature remained normal. After the sixth day the parts were irrigated from one to three times daily, through the tube, with a 2½ per cent. solution of carbolic acid. The tube was removed on the thirtieth day. The patient left the hospital, well and strong, on the thirty-fifth day. Dr. Graefe remarks, that whatever be the position this treatment will ultimately take, as compared with laparotomy, in these cases, there can be no doubt of its advantages in country practice, where the necessary assistants, instruments, etc., for laparotomy often cannot be had in time to be of service. These authors were

led to adopt this mode of treatment by a paper by Dr. Richard Frommel, which will be found in the *Zeitschrift für Geburtshülfe and Gynäkologie*, Bd. v., Heft ii. This author reports eight cases, seven treated by laparotomy, all of them fatal; one by drainage, which recovered.—*Med. Times and Gazette*, Oct. 22, 1881.

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Porro's Operation in England.

On Oct. 21st Mr. SPENCER WELLS performed Porro's operation, or a combination of the operations of Freund and Porro, on a patient aged 37, between five and six months advanced in pregnancy, and suffering from epithelioma of the cervix uteri. This is the first case where the operation in question has been performed in England, and the first instance where malignant disease of the uterus has been the indication for operative interference. The statistics and history of Porro's operation have been discussed at length by Dr. A. R. Simpson, in the last volume of the *Journal* (vol. i., 1881, pp. 910, 956). That operation is a supra-vaginal amputation of the uterus, in addition to the Cæsarean section. Freund's operation is total excision of a cancerous uterus by abdominal section. Mr. Wells has combined the two operations. In this case, strict antiseptic precautions were used. The urine was first drawn off, and the catheter left in the bladder. The vagina was plugged with wet phenolized cotton-wool, then the abdominal incision, about eight inches long, was made; the uterus was thus exposed. The fœtal movements were active. The uterus was brought out of the wound, the upper half of which was temporarily closed by several silk sutures. By this means, the edges of the wound were kept as near together as possible; the intestines, which gave no trouble during the operation, being guarded with sponges. The left broad ligament was next transfixed by a stout silk ligature external to the ovary and below the Fallopian tube. The same proceeding was repeated on the right side. The bladder was then dissected off the uterus, the walls of which were very thin. A small rent was made into the uterine cavity during the process of separation of the bladder, the liquor amnii escaped, and the fœtus, which measured ten inches and three-quarters and weighed fourteen ounces, was extracted, and the umbilical cord divided, the placenta being left in the uterus; the fœtus only made three or four respiratery efforts. The ureters were invisible throughout the operation. After the separation of the bladder, the cancerous mass close around the os uteri was exposed. The uterus was separated by cutting through the vaginal wall around and quite close to the uterine wall; all bleeding surfaces, as they were divided, being secured by pressure-forceps. These forceps were afterwards removed, and all bleeding vessels secured by ligatures of phenolized silk. The opening from the peritoneal cavity into the vagina was closed by silk sutures, after removing the vaginal plugs of cotton-wool. The operation, from the first incision through the abdominal integuments to the tying of the last suture in the abdominal wound, lasted sixty-five minutes. Very little blood was lost. The growth around the os uteri was examined microscopically when fresh, and proved, as expected, to be an epithelioma; it formed a nodular, exuberant mass, not yet in a state of ulceration. The uterus and its appendages weighed fourteen ounces and a half, precisely half an ounce more than the fœtus. The patient suffered chiefly from sickness during the first two days after operation, but, she said, not more than after some of her previous labours. On the third day, it was observed that many women after a perfectly natural labour had more fever, and appeared to suffer more from after-pains, and presented an aspect of more severe illness, than this patient. When last heard of, on October 27th, she was progressing favourably.—*British Med. Journ.*, Oct. 29, 1881.

Excision of the Gravid Uterus with Epithelioma of the Cervix.

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, Nov. 26, 1881), Mr. SPENCER WELLS reported a case in which a uterus with malignant disease of the cervix, and containing a fœtus at the sixth month, was removed through the divided abdominal wall, and the patient recovered. She was thirty-seven years old, mother of five children, six months pregnant, and her cervix uteri surrounded by a mass of epithelioma. The uterus was extirpated entirely on the 21st of October. The incision in the abdominal wall was eight inches long, the uterus was brought out through the incision, separated from the bladder after tying the main arteries on each side, the liquor amnii and fœtus removed through the anterior uterine wall, the vaginal attachments separated all round, the uterus removed, all bleeding vessels tied, and the communication between the vagina and peritoneal cavity closed by sutures. The abdominal wound was closed in the usual way. Phenol spray and all the usual antiseptic precautions were adopted. The various steps of the operation were described, and several modifications were suggested as improvements in future operations. The uterus preserved in the museum of the College of Surgeons was shown at the meeting. Total extirpation of the uterus, both by the hypogastric and vaginal methods and by a combination of the two methods, was briefly discussed. It is believed that this is the first case on record where excision of a gravid cancerous uterus has been followed by the recovery of the patient. Similar cases must be rare, but total extirpation of a cancerous uterus where pregnancy does not complicate the case will hereafter, much more frequently, become the subject of anxious consultation.

Dr. GRAILY HEWITT said that he shared the responsibility of advising the performance of the operation. The patient was in a lamentable state of weakness, and had not slept at night for some weeks; she had severe continuous pain in the hypogastric region. The disease had implicated the cervix uteri to a considerable extent, but was strictly limited to it; and there was a very characteristic cord of indurated tissue. With regard to operation, three courses suggested themselves: 1. Induction of premature labour and excision of the cervix; 2. Excision of the uterus and cervix; 3. Allowing the pregnancy to go on to full term. Of these, the last was dismissed as unadvisable on account of the weakness of the patient, and because the disease was making rapid progress, and it was not at all certain that delivery could be effected *per vias naturales* after two months—during which time, also, the patient would be subjected to the debilitating influence of the spreading disease. As regards the other plans, Mr. Wells expressed himself so hopeful of success by total extirpation, that the operation was advised. Even if labour had been induced, and the diseased cervix excised, the patient would have been exposed to much risk. The operation appeared to be a difficult one; the uterus was very thin, and was not easily removed from the bladder. The chief difficulty seemed to be the avoidance of the ureters. In the ordinary Porro's operation, these were more easily avoided than when the whole uterus and the cervix were removed.

Dr. W. S. PLAYFAIR said that the patient first came to him complaining of leucorrhœal discharge. He found epithelioma of the anterior part of the cervix, and advised that labour should be induced, and that the epithelioma should then be dealt with. This, however, was delayed; and the disease in the mean time made rapid progress. In such cases, complete excision unquestionably gave the best chance of recovery. But cases of pregnancy complicated with cancer were very rare; and the important question was, as to excision of cancer affecting a non-gravid uterus. He had thought much on this. As to epithelioma limited to

the cervix, in ordinary circumstances, and when seen early, it could be dealt with without the risks attendant on abdominal section, by Dr. Marion Sims's method of excising and scraping away the whole of the diseased mass, and then applying chloride of zinc so as to produce a slough. He had done this in five or six cases with very satisfactory results. The operation was attended with much less risk than abdominal section, but it did not prevent the subsequent adoption of this, if necessary. On the other hand, in medullary cancer affecting the body of the uterus, abdominal section would be of the greatest importance. Accurate diagnosis, however, was a matter of extreme difficulty; and fixation of the uterus, which was the diagnostic point, itself indicated that operation was inadmissible. He had met with a case in which, when first seen, Freund's operation might have been performed; it was, however, delayed for a fortnight, within which time the uterus became fixed, and an operation could no longer be proposed with safety. He had also seen, a month ago, with Dr. Matthews Duncan, a case in a pregnant woman, in which there was severe hemorrhage, thought at the time to be, perhaps, from malignant disease. Since then, labour had come on spontaneously; and now, on again seeing the patient in consultation, he had found the disease too far advanced for operation. He believed the surgical operation to be the easiest and simplest. Great credit was due to the late Dr. Blundell for recognizing the importance of removal of the uterus, and performing the operation.

Dr. MATTHEWS DUNCAN thought that Mr. Spencer Wells's operation should cause admiration, that it was shown to be possible to extirpate safely a gravid uterus with the cervix in a state of malignant disease. But, possibility was one thing, and advisability another; and, to decide the latter, more experience was wanted. He had studied the records, at home and abroad, of operations for removal of uterine cancer. In cancer of the cervix, extending to the body of the uterus, there had been considerable success; in cancer of the supravaginal portion of the cervix, the cases had generally done well; but, in common cancer of the cervix, the operations had been very unsuccessful. Mr. Wells's operation had the advantage of being done without waiting for delivery, and of thus avoiding the intrinsic perils of labour.

Mr. KNOWSLEY THORNTON believed that, in tying the spermatic arteries, Mr. Wells had also tied the left uterine artery. If it were possible to tie off the ovaries and spermatic arteries, and then fearlessly cut down, the uterus could be readily drawn out; and there would be necessity for only a few ligatures, the abundance of which was a disadvantage in Freund's operation. The extension of the disease into the body of the uterus showed how unavailing any partial removal would have been. He had seen cases where the disease spread so rapidly that only a week elapsed before the idea of operating had to be abandoned. He thought that drainage should be employed in all such cases as those described by Mr. Wells; and he would suggest that, during the operation, the surgeon who had charge of the abdominal portion should have nothing to do with the vagina. His experience of Dr. Marion Sims's operation had not been so favourable as that of Dr. Playfair.

Mr. DORAN observed that the greatest importance must be attached to the significance of induration round the lower part of the uterus. In this case, Dr. Playfair had observed no induration; but a few weeks later, during the operation, slight hardening was detected. Examined microscopically, this hardening tissue was found infiltrated with leucocytes—a condition commonly seen in tissues adjacent to a cancerous growth, but not at first involving cancerous infection. If the growth be removed, with as much of the infiltrated portion as possible, then the leucocytic infiltration remaining behind generally disappeared. This, at least, was observed in other organs. But cancerous infection of the hardened

tissue was very rapid: hence it appeared that the early detection of hardening was the indication for immediate operation, and not for the abandonment of all attempts to remove the disease.

Dr. HARRIS, of Madras, had met there with a case of cancer of the cervix uteri, in a woman aged 26, in whom he had removed, in succession, portions of the cervix and uterus, and at last excised the uterus itself *per vaginam*. The woman, however, lived only three days. He preferred the vaginal operation.

Dr. BANTOCK congratulated Mr. Wells on his success. He had operated for removal of a cancerous uterus, in circumstances of much difficulty, on a very stout woman. The uterus was readily separated from the bladder, and the ureters were easily avoided. He had been obliged to leave an opening into the vagina, and thought that the effused blood might escape by it.[1] There was, however, a considerable collection of blood in Douglas's pouch, perhaps because the opening had been closed by the intestines. It would have been better to put a drainage-tube into Douglas's pouch.

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Extirpation of the Uterus.

The successful case which Mr. Spencer Wells brought forward at the recent meeting of the Royal Medical and Chirurgical Society, and the animated discussion which it provoked, must inevitably turn the attention of British surgeons once more to a subject compared with which ovariotomy appears as a question of minor surgery. During the meeting, reference was frequently made to the researches of OLSHAUSEN, who, in a recent number of the *Berliner Klinische Wochenschrift*, has discussed the relative merits of operating by gastrotomy or from the vagina, for total extirpation of the uterus. He bases his opinion on ten cases of his own, so that his arguments will bear the weight of a greater experience than can be claimed by any English operator. Not forgetful of the fact that it is mainly to the British surgeon, who has most successfully undertaken this operation under desperate circumstances, that surgery is indebted for the development of that department of the operative art which has made extirpation of the uterus possible, we must consider, with the attention it deserves, the

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personal record of Dr. Olshausen's experience. The chief dangers which beset the patient after operation are shock, hemorrhage, septicæmia, and serious damage to the ureters and other organs, through laceration or unintentional inclusion in ligatures. The hope must not yet be entertained that no operation of this kind need ever be incomplete. Few of the innumerable proposals for improving the operation by detail are of much importance. Rydygier and Billroth advocate the isolation, by careful search and dissection, of the uterine artery. Bardenheuer recommends separate transfixion of the lower segment of the broad ligament, and lays great stress upon the maintenance of warmth by artificial means, as well as on drainage of the abdominal cavity. Breisky is in favour of a preliminary separation of the vaginal wall from the uterus. Olshausen warns surgeons against attaching too great importance to Bardenheuer's successful results after drainage, and believes the practice to be prejudicial in ovariotomy, removal of pedunculated fibroids, and supravaginal amputation of the uterus; for, in such operations, it is more important to remove all sources of infection at once from the peritoneum, than to take steps for the complete escape of all subsequent secretions. He admits that conditions, with regard to drainage, are somewhat different in total extirpation of the uterus, where the vagina must, of necessity, be laid open. The results of operating through abdominal incision are not brilliant. Up to the end of 1880, 94 cases are recorded, with but 24 recoveries. Out of Olshausen's 10 cases, 4 were performed in this manner, only the first recovering; and, in this case, malignant disease recurred in five months, and death followed sixteen months later. The remaining 3 died of shock. Forty-one cases of total extirpation of the uterus from the vagina are recorded, 29 recovered, including 3 where the operation was not performed for cancer. Olshausen's 6 cases all recovered; they have already been described elsewhere. Referring to matters of detail, he recommends complete disinfection of the vagina by plugs of wool dipped in a five per cent. solution of carbolic acid, and a preliminary scooping away of soft fetid material from the seat of disease. After cutting the vaginal wall, so as to leave a wide margin to the new growth, the divided vessels must be carefully secured, and the bladder must be separated from the uterus, from below upwards, with two fingers forced between those organs; after thus separating the uterus, it is advisable to plug its cavity. The broad ligament should be secured by passing round its base a thin soft-iron wire, introduced through the canula of a strongly curved trocar; then a silk ligature is passed through the ligament laterally, external to the wire. Much judgment is required in deciding how far the ligament must be cut away on the distal side of the ligatures; if the stump slough, it matters little, provided that every care be taken to keep the vagina clean after operation; indeed, sloughing is rather advantageous if a trace of new growth be left behind. Olshausen leaves Douglas's pouch open, after freely washing it out with a two per cent. solution of carbolic acid. The sutures are removed about the seventh day; drainage need not be continued longer than eight days. It is, he repeats, in just such an operation as this that drainage is actually efficient, since, in these cases, blood and secretions come into contact with but a limited and accessible part of the peritoneal cavity; and it must be maintained as effectually as possible during the last few days before it is dispensed with, since, when the opened surfaces of peritoneum are about to close, that is just the time when the peritoneal cavity must be left free from fluids that may cause infection.

Professor Olshausen considers that the operation is only justifiable in cases of malignant growths, particularly when accompanied by prolapsus uteri. The main question before deciding on an operation is, how far the disease has progressed; enlarged glands, evidences of parametritis, and great impairment of the mobility of the uterus, manifestly contraindicate its removal. In short, the opinions of

so experienced an authority as Professor Olshausen, with regard to a new operation of so great severity, may be summed up in this manner. Should the operation be undertaken, then the surgeon must act, as Lucan said that Julius Cæsar was wont to act, on the principle that nothing is done while anything remains to be done. Experience can alone teach the numberless matters of detail which must be attended to in individual cases. Still, in many instances, it is far safer, both as regards the life of the patient and the credit of the operation, to modify the principle, and to consider that nothing should be done if there be the least likelihood that anything cannot be done.—*British Med. Journal*, Nov. 26, 1881.

[In connection with this subject the reader is referred to Dr. Fenger's elaborate paper on page 17 of this JOURNAL.—ED.]

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Uterine Displacements.

Dr. PAUL F. MUNDÉ gives the following resumé of his valuable paper on the treatment of uterine displacements:—

1. *Recent* displacements of any variety are the only cases which offer a fair chance of complete recovery by any of the mechanical means at our disposal.

2. Of these means, pessaries are the most convenient for temporary relief, but only in a comparatively small number of cases does permanent cure result.

3. The best curative means of support of the displaced uterus is probably the systematic and intelligent use of vaginal tampons, impregnated with a mild astringent solution.

4. Posture, while excellent as a means of relaxing the uterine supports and relieving pelvic congestion, is by its inconvenience at best but a means of temporary relief.

5. Permanent relief, *cure*, can be expected and will be obtained only when the displacement is of recent origin, especially when it has been produced by some sudden physical shock; or when the complete tissue-metamorphosis accompanying puerperal involution aids in restoring to the uterine supports and the uterus itself their original and healthy tone.

This fortunate occurrence must be looked upon as decidedly the exception, since the favouring circumstances above mentioned are but rarely met with or the displacement is seldom recognized at a sufficiently early date to permit of a perfect restoration to health.

6. The most favourable period, therefore, for the treatment of a uterine displacement or distortion with the view to a permanent cure is within one or two weeks after delivery, before the woman has left her bed.

7. The excitation of a certain amount of plastic exudation in the walls of a flexed uterus may, if kept within bounds, result in permanent straightening of the organ. This may be accomplished by rapid dilatation, or by the protracted wearing of stem-pessaries, but permanent success will at best be rare.

8. The protracted wearing of astringent vaginal tampons, introduced daily, offers for some cases of ante- and retro-displacement an excellent, and for most cases of procidentia, almost the only efficient and safe remedy for the displacement, far superior to all steadily-worn hard or soft pessaries. A procidentia of uterus or vagina may even be cured by several months of this treatment, if the affection be not of too long standing.

9. While permanent cure is only occasionally met with, so much relief is afforded by pessaries and the other mechanical supports and methods above discussed that they should in no case be discarded, unless all treatment be counterindicated.

10. Electricity, if rationally and scientifically applied for a sufficiently long

period, offers chances of cure of comparatively recent cases, which call for a more thorough and persistent trial of the method.

11. For prolapsus uteri et vaginæ, unless of quite recent origin (see tampons), an operative constriction of the vaginal canal and a restoration of the relaxed or destroyed perineum to its normal state is the only sure means of cure, and even for this affection the unfailing method remains still to be discovered.

12. The *cure* of a flexion by operative (bloody) treatment is impossible; the canal may be made comparatively straight by a division of one or the other or both lips of the cervix, but the flexed shape of the organ still remains. Only by gradually increasing elevation of the fundus by a vaginal pessary (best, Thomas's cup), after delivery, or by the protracted wearing of an intra-uterine stem, can in a small proportion of cases a permanent cure be effected.—*Amer. Journ. of Obstetrics*, Oct. 1881.

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The Relation of Anteflexion of the Uterus to Dysmenorrhœa.

Dr. HERMAN read a paper with the above title at the meeting of the Obstetrical Society of London, on Oct. 5th.

The object of the paper was to inquire as to the correctness of the widely accepted theory that anteflexion causes dysmenorrhœa, by leading to narrowing or temporary occlusion of the uterine canal at the point of bending. The evidence required to prove this was of two kinds, anatomical and clinical. The anatomical was first considered. First, it had to be shown that in anteflexion the canal was bent at an angle, and that a spur of tissue projected inward and blocked up the canal, as figured diagrammatically in many works. But in four specimens of anteflexion in London museums the curve was quite gradual; there was no angle, or dilatation of the uterine cavity. Next, the author had searched in vain for any case of retention of the menstrual blood and dilatation of the uterine cavity for which no other cause than an anteflexion existed, or of a pelvic hæmatocele, dependent upon stenosis of the uterine canal from anteflexion. The clinical evidence was then discussed. The arguments in favour of the theory fell into three groups. 1. That drawn from the patient's sensations. 2. That drawn from the afferent hindrance to the passage of the uterine sound. The author gave reasons for thinking these arguments inconclusive. 3. That drawn from the frequent association of acute flexion with dysmenorrhœa. The author pointed out that before concluding from this association that the anteflexion is the cause of the dysmenorrhœa, it was necessary to know how often anteflexion occurs without functional disorder of the uterus. He quoted summarized statistics from various other observers, which showed that out of 431 women anteflexion was present in 185, and the uterus was straight and in the axis of the pelvis only in 153. He had himself examined 102 women, who had applied for treatment, not for functional disorders of the uterus, but for local contagious disorders, and in 49 of these he found the uterus markedly anteflexed. Of the 53 in whom the uterus was slightly or not at all bent, in 38 there was little or no pain at the menstrual period, and in 15 severe pain, but of the 49 in whom there was pronounced anteflexion, in 33 there was little or no pain at the menstrual period, and in 16 severe pain. So slight a difference the author thought was practically none. As to the effect of treatment, the author pointed out that dysmenorrhœa with anteflexion was often curable by rest, by vaginal pessaries, by depletion, by incision, or by dilatation of the cervix, remedies which do not straighten the uterus. Benefit following the use of intra-uterine stems might be due to their effect in dilating the canal, in stimulating the uterus, or to the preparatory treatment. In cases in which the first mentioned kinds of treatment had failed, there was no evidence

that intra-uterine stems succeeded. The purport of the paper was summarized in the following propositions: 1. That there is no anatomical evidence that anteflexion causes any hindrance to the escape of menstrual fluid. 2. That there is reason to think that well-marked anteflexion is present in nearly half of all women who have not borne children. 3. That, therefore, it is to be expected that anteflexion and dysmenorrhœa would frequently coincide. 4. That dysmenorrhœa is practically as common when the uterus is straight as when it is anteflexed. 5. That painless menstruation is practically as common when the uterus is anteflexed as when it is not. 6. That when dysmenorrhœa and flexion go together, the severity of the pain bears no relation to the degree of the bending. 7. That dysmenorrhœa, associated with anteflexion, is frequently cured without straightening the uterus. 8. That there is no evidence that straightening the uterus invariably or even frequently removes dysmenorrhœa which is associated with anteflexion, and in which other methods of cure have been ineffectual. 9. That these facts show that the relation between anteflexion and dysmenorrhœa is not that of cause and effect, but merely that of coincidence.—*Lancet*, Nov. 12, 1881.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Permanganate of Potassium as an Antidote to Serpent Venom.

M. DE LACERDA has recently presented to the *Académie des Sciences* the result of some experiments which tend towards establishing the value of the permanganate of potassium as an antidote for snake-venom. One or two minutes after a subcutaneous injection in a dog of the active venom of the *Bothrops*, the author injected in the same place an equal quantity of a one per cent. filtered solution of permanganate of potassium. The effects of the poison were completely removed by the second injection.

Permanganate of potassium succeeds equally well as an antidote when the poison is injected directly into a vein; out of thirty experiments, there were only two failures; and these, he thinks, can be attributed to the facts that, in the first place, the animals were badly nourished, and feeble, and very young; and in the second place, the administration of the antidote was delayed too long. In another series of cases the author injected into a vein a half Pravaz syringeful of a solution made with ten grammes of water and the poisonous product of twelve or fifteen snake bites, and a half minute later two cubic centimetres of a one per cent. permanganate of potassium solution. With the exception of some transient agitation, and sometimes cardiac acceleration, the animal, though observed for several days, showed no symptoms of poisoning.

The author has also administered the poison and then waited for characteristic symptoms before administering the antidote. At the moment when there is marked dilatation of the pupil, cardiac and respiratory disturbance, convulsions, micturition, and defecation, he injected repeated doses of from two to three cubic centimetres of potassium permanganate solution, and at the end of three to five minutes the symptoms disappear, prostration alone remaining for fifteen or twenty minutes longer, when the animals appeared perfectly normal. Other dogs in which the same quantity of poison was injected, but without the antidote, died very rapidly.

In the presence of these facts, M. de Lacerda thinks that in the permanganate

of potassium we have a true antidote to serpent venom.—*Bulletin Général de Thérapeutique*, Oct. 15, 1881.

Since the appearance of the above memoir, the *Lancet*, Nov. 5, 1881, has pointed out that M. Lacerda's conclusions cannot be accepted without considerable reserve, since permanganate of potash has been before tried and found wanting. Sir Joseph Fayrer and Dr. Brunton found that its injection made little difference in the rapidity of the death of animals bitten, although it had the power of destroying the virulence of the poison if mixed with it outside the body. They also doubt the possibility of the efficiency of any chemical antidote when the poison is once circulating in the blood. It is, however, probable that antidotes, if they exist, are not equally efficacious for all serpent poisons, and the careful observations of Lacerda justify the hope that for one, at least, he has discovered an antidote which is effective.

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Tobacco Poisoning.

Dr. J. M. BIGELOW reports the case of a young man who had been suddenly seized, on the street, with a convulsion, of which there was no premonition. Found him pallid; countenance pinched and contorted; pulse variable, being for a few seconds 136 to the minute, then 38, and intermittent. Heart action was very irregular, the sounds muffled and running into each other. Temperature was normal. Eyes were staring, pupils dilated. He had severe pain and distress in the left side, especially over the heart. Dyspnœa was marked; respiration sighing; hiccough; cold perspiration and great prostration. Convulsions rapidly succeeded, with great agitation of the extremities, without loss of consciousness, and at their termination, anæsthesia, especially of the left side, with uncontrollable nervous tremor. After the transit of the convulsions a cataleptic condition was observed. This passed off, and was succeeded directly by hysterical tremors, convulsive twitching of the flexor muscles of the whole body, with agonized apprehension of approaching catastrophe and death. He would clutch the arm of a by-stander and beseech him to save his life, to relieve him of the great precordial distress and threatening suffocation. Conversation or any violent motion of the attendants provoked these spasmodic attacks.

It was learned that this was his third attack within a year. He was an excessive tobacco smoker, sometimes consuming ten cigars a day; he had begun its use at the age of twelve. He had little appetite most of the time, was pale and cadaverous, enfeebled, restless, starting in his sleep, and his disposition had become irritable. There was no family history of nervous disease; his own health, aside from this, had been good.

Morphia was given hypodermically and bromide of potassium and carbonate of ammonium internally, and in a few days iron, quinine, and strychnia: tobacco was interdicted. The latter injunction was disregarded, and four days later he had another even more violent convulsion; he then gave up tobacco, and has since been in good health.—*Med. Annals*, Nov. 1881.

In the *Revue Scientifique* for Nov. 19, 1881, there is a paper by M. THOREUS on this subject, in which attention is particularly directed to tobacco poisoning as productive of symptoms closely allied to those of angina-pectoris, particularly when the tobacco smoke is inhaled.

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